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Welcome to *SUURJ*

Welcome to the second volume of the *Seattle University Undergraduate Research Journal* (*SUURJ*). Herein, you will encounter the results of a year-long collaboration between students, faculty, and administrators dedicated to amplifying undergraduate student voices. Through developing and publishing research conducted by undergraduates across disciplines and grade levels, *SUURJ* empowers students to share a diversity of perspectives within university, local, and global communities. Indeed, our journal holds the foundational value of strengthening student voices in dialogues beyond the classroom. As members of the *SUURJ* editorial team, we feel compelled to emphasize the importance of listening to these voices, especially considering that many have been silenced, both currently and historically.

We believe that every voice deserves to be heard in our school, city, and world. Consequently, we have not selected research for publication based solely on a traditional system of merit; we have also endeavored to create a journal that features interdisciplinary research and dares to engage in challenging discourse. We welcome hitherto silenced voices. The inclusion of diverse perspectives is imperative now more than ever given the state of our social and political climate.

The potential for undergraduate research to inspire social change is not entirely obvious. Academic research is often perceived as dry, lofty, inscrutable, elitist, and disconnected from the realities of being and acting in the world. While these descriptions may validly apply to many people's experiences of academic research, the influence and voice that research can carry are often underrated, particularly at the undergraduate level. Many will agree that, on some level, "research" has been incredibly impactful in shaping who we are today as humans, as scholars, and as communities. But questions remain: What impact can a single research paper have? Whose voices are dominantly featured in what we call "academic research," and what do these voices tell us? What happens when marginalized voices research and write "against the grain," and what do *they* tell us? What are the ethical responsibilities of editors as they approach texts, and what are the consequences of editing itself? How are we to decipher what constitutes "good" research? Who holds the privilege of being the decipherer?

It is our belief, as editors of *SUURJ*, that research papers are most effective when power is shared between the author, editor, and community through collaborative dialogue. We maintain that academic and extracurricular conversations benefit from a diversity of perspectives and methodologies, and that undergraduate research is a valuable, yet untapped, source of ideation. Most of all, we strive to open the gates for conflict to be addressed and discourse to be held within and outside of Seattle University, especially by those who dominant culture has historically barred from doing so. We have selected and edited the pieces

in *SUURJ* with these values in mind. We hope to not only act according to our goals and values with this second volume, but to increasingly embrace our mission as the future of *SUURJ* unfolds. Thank you for choosing our journal; here, we hope you will find as many ideas and truths as we have.

In humble solidarity,
The Student Editors of *SUURJ*

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Core Writing

Exploring the Therapeutic Potential of Psychedelics

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Introduction

Psychedelic compounds, those commonly associated with the recreational drug use of the counterculture movement of the 1960s and 1970s, have long been misunderstood. Research with psychedelic compounds dates to 1897 when mescaline, the primary psychoactive compound of the peyote cactus, was first isolated by German chemist Arthur Heffter (Bayliss, 1987). In 1943, Swiss chemist Albert Hofmann first discovered the psychedelic effects of lysergic acid diethylamide, commonly known as LSD, at Sandoz Pharmaceuticals in Basel, Switzerland (Hofmann, 1970). Hofmann went on to isolate psilocybin and psilocin, the psychoactive components of Psilocybe mexicana, also known as the Mexican "magic mushroom," 15 years later in 1958 (Hofmann, 1970). Unbeknownst to the general public, close to 700 studies with psychedelic compounds took place before 1972, with research suggesting that psychedelics offer significant therapeutic benefits, including "helping recovering alcoholics abstain, soothing the anxieties of terminal cancer patients, and easing the symptoms of many difficult-to-treat psychiatric illnesses, such as obsessive-compulsive disorder" (Brown, 2007, p.67).

Research with these compounds has shown strong therapeutic promise for helping treat mental health conditions. However, multiple factors led to a strict federal regulatory environment in the absence of a compelling medical or scientific rationale (Hendricks, Thorne, Clark, Coombs, & Johnson, 2015). These factors include sensationalized media coverage of the recreational use of psychedelics in the 1960s and the administration of psychedelic compounds to an undergraduate population at Harvard University in poorly designed and controlled experiments (Russin & Weil, 1963). Unfortunately, a fuller exploration of the potential therapeutic use of these compounds was restricted in 1970 when the Controlled Substance Act was passed and established five levels of drug severity, with psychedelics being categorized as Schedule I, the strictest level (Hendricks et al., 2015). Though initial scientific exploration of the potential benefit of these compounds was halted, there has been a resurgence of interest in the field. This paper supports the idea that psychedelics can be largely beneficial in the therapeutic treatment of mental health conditions such as anxiety, depression, and addiction. The psychedelics that are explored in this paper include psilocybin, LSD, and ayahuasca, known for its isolated alkaloid, DMT. This paper will explore first a general therapeutic overview of psychedelics; second, psychedelics in the treatment of anxiety and depression; and third, psychedelics in the treatment of addiction.

Overview of Therapeutic Use

It is important to establish that psychedelics can be beneficial in therapy for serious mental health conditions. These compounds have been stigmatized since their DEA scheduling in the 1970s, limiting significant research into the treatment of disorders that are still not fully

understood in the psychiatric community. With mental health problems affecting almost half a billion people worldwide at substantial cost to society (World Health Organization, 2001), more effective treatments are needed. Psychedelics are a viable option for innovative mental health treatments for several reasons. Psychedelic compounds have naturally occurred in various plant and fungi species for millennia and cultures across the world have used them in sacramental healing contexts for over 5,000 years (El-Seedi, De Smet, Beck, Possnert, & Bruhn, 2005; Nichols, 2004). Psychedelic compounds are known to affect all mental functions, including perception, emotion, cognition, awareness of body, and sense of self (Brown, 2007). The effects of psychedelics depend heavily on the environment and the expectations of the subject (Brown, 2007), which is why combining them with psychotherapy is crucial. This also explains why the recreational use of psychedelics is vastly different than the therapeutic use of the same compounds. According to psychiatrist Rick Strassman, "psychedelics can be therapeutic to the extent that they elicit processes that are known to be useful in a therapeutic context: transference reactions and working through them; enhanced symbolism and imagery; increased suggestibility; increased contact between emotions and ideations" (as cited in Brown, 2004). This means psychedelics may enhance well-established therapy techniques. The classic psychedelic treatment method has the goal of inducing a "psychedelic," "mystical," or "peak" experience, which has been understood to elicit lasting change in habitual patterns of thought, emotional response, and behavior and which can be a key factor in the treatment of conditions such as addiction (Hoffer, 1967; Sherwood, Stolaroff, & Harman 1962).

Brief Psychopharmacology of Psychedelics

Psychedelics are divided into two basic chemical groups: tryptamines—such as psilocybin, LSD, and DMT—and phenethylamines—such as MDMA and mescaline (Brown, 2007). Tryptamines are a family of compounds that "selectively bind to specific serotonin (5-HT) receptors on neurons, mimicking the effects of the nerve-signaling chemical, or neurotransmitter, serotonin on these receptors," which is responsible for stimulating parts of the brain related to important functions including mood, memory, appetite, sex, and sleep (Brown, 2007, p.67). Research with rat models has shown that tryptamines activate a specific subtype of serotonin receptors known as the 5-HT_{2A} subtype, inducing down-regulation of these receptors, effectively reducing binding at these receptors (Bogenschutz & Johnson, 2015). This is relevant to psychotherapy because increased binding at 5-HT_{2A} receptors has been reported in people with depression (Shelton, Sanders-Bush, Manier, & Lewis, 2009), impulsive aggression (Rosell et al., 2010), completed suicide (Anisman et al., 2008), and other mental health conditions. Also, 5-HT_{2A} receptor down-regulation could be effective in treating anxiety, stress, and addiction. Research has shown a positive correlation between fronto-limbic 5-HT_{2A} receptor density and increased anxiety and exaggerated stress response, both of which

are important triggers for relapse to substance abuse (Frokjaer et al., 2008; Sinha & Li, 2007). Another benefit of the use of psychedelics as therapeutic drugs is that they are noninvasive. Physiological toxicity and evidence of resulting organ damage or neurophysiological deficits are virtually nonexistent regarding the use of psychedelics, even at very high doses (Gable, 1993; Strassman, 1984). For these reasons, it is crucial to further explore the therapeutic uses of psychedelics. Because psychedelics can significantly influence habitual patterns of thought, emotional response, and behavior, considering the role of psychedelic therapy in the treatment of anxiety and depression is a logical step toward the treatment of the whole person who suffers from disorders of mental health.

Treatment of Anxiety and Depression

Anxiety and depression are serious mental health conditions that affect millions of people and often coexist and exacerbate one another (Hirschfeld, 2001). Most of the studies examined in this paper discuss anxiety and depression as related to palliative care. Several studies have explored the therapeutic use of psychedelics in the treatment of anxiety and depression in terminal cancer patients using psilocybin, including studies at New York University, Johns Hopkins University, and Harbor-UCLA Medical Center with results favoring the positive effects of psilocybin (Brown, 2007; Kelmendi, Krystal, Corlett, D'Souza, & Ranganathan, 2016). These studies have found that psilocybin can rapidly produce "large and sustained decreases in clinician- and patient-related measures of depressed mood and anxiety," improved quality of life, life meaning and optimism, as well as decreases in death-related anxiety in advanced-stage cancer patients (Kelmendi et al., 2016, p. 1212). These positive effects have also been shown to be fast-acting and long-lasting, not requiring chronic administration that most conventional medications necessitate. Follow-up studies conducted six and a half months to a year after the initial psilocybin session showed that the effects endured in over half of the individuals, while the vast majority reported the experience as increasing their life satisfaction and wellbeing (Ross et al., 2016). The fast-acting nature of psychedelics also seems promising in therapeutic treatment, considering most antidepressants on the market today take two weeks for the onset of therapeutic action (dos Santos, Osório, Crippa, & Hallak, 2016).

Psilocybin is not the only psychedelic that shows promise in the treatment of anxiety and depression. LSD has been shown to produce lasting reductions in anxiety in individuals with life-threatening diseases (Gasser et al., 2014). Additionally, ayahuasca and one of its isolated alkaloids, DMT, have shown anxiolytic and antidepressant qualities. Anxiety and depression are associated with increased rumination, which is characterized by cyclical thought. This behavioral tendency can cause individuals to spiral into a seemingly hopeless thought pattern of worthlessness and inadequacy. This is important because ayahuasca use has been shown to significantly reduce activity in areas of the brain associated with increased

rumination (dos Santos et al., 2016). Because ayahuasca dampens neural networks associated with rumination, it and other drugs targeting the serotonin system should be considered as plausible psychological treatment for conditions such as anxiety and depression. Evidence that serotonin receptor agonists regulate emotional processing, reduce anxiety and depressive symptoms, and increase positive mood supports a case for all tryptamines as effective in treatment of conditions related to these symptoms (dos Santos et al., 2016). Anxiety and depression have also been shown to be associated with inflammatory processes, and serotonin-receptor agonists have anti-inflammatory properties (dos Santos et al., 2016). This further supports a case for tryptamines such as psilocybin, LSD, and ayahuasca as effective treatments because they can potentially help reduce inflammatory processes associated with anxiety and depression.

Treatment of Addiction

Addiction is also related to anxiety and depression in the effects it has on human wellbeing. Most addiction treatments that are currently available are mildly effective at best, whereas research has demonstrated promise in the use of psychedelics for addiction treatment (Bogenschutz & Johnson, 2015). The leading preventable cause of death and disability globally is addiction to alcohol, tobacco, and other drugs (Rehm, Taylor, & Room, 2006; Volkow & Li, 2005). Several lines of research have shown psychedelics to be nonaddictive (Berglund, 2005; Bogenschutz, & Pommy, 2012) so addiction to psychedelics is not of significant concern. On the contrary, LSD has been shown to be almost twice as effective in the treatment of alcoholism as compared to standard treatments (Krebs & Johansen, 2012,). One of the tenets of Alcoholics Anonymous, or AA, is the concept of spiritual awakening, the idea that lasting behavioral change in recovery can be brought about by a mystical-type experience (Forcehimes, 2004). Bill Wilson, the founder of AA, acknowledged the efficacy of LSD use to help alcoholics experience spiritual insight and became an enthusiastic proponent of the compound based on his own LSD experiences (Kurtz, 2008).

At least six different studies conducted during the early psychedelic research era have shown results supporting the effective treatment of alcohol addiction with LSD treatment (Bowen, Soskin, & Chotlos, 1970; Hollister, Shelton, & Krieger, 1969; Ludwig, Levine, Stark, & Lazar, 1969; Pahnke, Kurland, Unger, Savage, & Grof, 1970; Smart, Storm, Baker, & Solursh, 1966; Tomsovic & Edwards, 1970). Psilocybin has also been effective in the treatment of alcohol addiction, with results "displaying improvement in drinking habits with decreases in craving and increases in abstinence self-efficacy" (Bogenschutz & Johnson, 2015, p. 5). Decreased rates of alcohol addiction have been consistently correlated with ayahuasca use (Doering-Silveira et al., 2005; Halpern, Sherwood, Passie, Blackwell, & Ruttenber, 2008). It has also been frequently reported that peyote use in the context of Native American Church ceremonies

helps individuals who are recovering from alcohol addiction achieve and maintain sobriety (Albaugh & Anderson, 1974; Garrity, 2000; Kunitz & Levy, 1994; Lu et al., 2009). Another study has shown psilocybin to be highly effective in the treatment of tobacco addiction, more than doubling abstinence rates of approved tobacco addiction treatments and resulting in excellent clinical outcomes (Johnson, Garcia-Romeu, Cosimano, & Griffiths, 2014). In regards to the role of psychedelic mechanisms in addiction treatments, psychedelics are believed to induce changes in neuroplasticity, suggesting a possible biological basis for persisting behavioral change (Bogenschutz & Johnson, 2015). Other possible mechanisms include emotional catharsis (Albaugh & Anderson, 1974) and improved self-understanding and motivation for sobriety (Garrity, 2000). Psychedelics seem promising in the treatment of addiction because they lack addictive effects themselves, can provide mystical-type experiences found to support naturalistic addiction recovery and are safe when used in a proper therapeutic context. Additionally, they can induce long-lasting changes in behavior, while non-psychedelic medications for addiction treatments only provide effects as long as they are being regularly taken.

Conclusion

Therapeutic treatment with psychedelics seems especially promising considering that their healing covers a broad scope—working on a physiological, psychological, and even mystical or spiritual level. The quick onset and noninvasive, persistent effects of psychedelics are highly preferable in therapeutic treatment. Investigation of these compounds could provide new pharmacological treatments with fast-acting beneficial effects for patients with anxiety, depression, and addiction.

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Framing Protesters: Description Bias in the Coverage of the Malheur National Wildlife Refuge and Charlotte Protests

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Introduction

The right to collectively organize and advocate for systemic change is foundational to democracy in the United States, and protest retains its significance in our cultural and political landscape to this day. In 2016, a surge of activism covered issues from environmental injustice at Standing Rock to political dissatisfaction following the presidential election. The media's role in framing such protests, or emphasizing certain aspects while ignoring others, is essential to developing the public understanding of protesters' goals and determining the salience of their message (Iyengar 254). Consequently, journalists play a role in determining the efficacy of protest. The frame through which a protest is portrayed can even serve to counter the goals of protesters, especially when implicit biases are present. With over 80% of individuals in the newsroom identifying as white, racial bias may frequently influence the way stories are framed (Savali). For example, in the coverage of many Black Lives Matter protests against police shootings of unarmed black men, racial bias is apparent through negative imagery that paints black protesters as "barbaric" (Savali). This bias creates a double standard whereby white protesters are often forgiven for utilizing violence while black protesters are held to a higher, almost unreachable, standard.

To understand how framing bias occurs, it is important to consider two types of framing: episodic and thematic. In *Media Politics*, political scientist Shanto Iyengar defined episodic framing as "[depicting] issues in terms of individual instances or specific events . . . typically [featuring] dramatic visual footage and pictures" (255). A thematic frame, on the other hand, addresses "a public issue in a general context and usually takes the form of an in-depth background report" (Iyengar 255). Both thematic and episodic framing can contain description bias, which is defined by sociologist Jennifer Earl as bias related to the "omission of information, misrepresentation of information, and framing of [an] event by the media" (Earl et al. 72). For this study, I concentrated on the latter part of the definition that focuses on framing.

This study examines the media coverage of two protests that took place in 2016—the anti-government protests at Malheur National Wildlife Refuge in Harney County, Oregon, and the Black Lives Matter protests in Charlotte, North Carolina—with the intention of discovering whether the media evidenced description bias in the framing of the two demonstrations. The concerns of each protest were different, but both movements sought to create change by drawing public attention to their respective issues. However, to bring their agendas before a national audience, protesters rely on media coverage of their demonstrations, and the frame through which events are portrayed can influence public opinion of the issues at stake. During the coverage of the Malheur and Charlotte demonstrations, the US mainstream media exhibited description bias by disproportionately using a thematic frame for the anti-government protest and an episodic frame for the Black Lives Matter protest, resulting in

opportunities for the public to understand the Malheur movement in ways that the Charlotte movement was not afforded.

Background

On January 2, 2016, a dozen anti-government protesters travelled to Harney County, Oregon, and took over the Malheur National Wildlife Refuge. While the protesters were confronting the US Bureau of Land Management (BLM) over government encroachment on their land, the leaders of the occupation, Ammon and Ryan Bundy, were simultaneously protesting the imprisonment of two ranchers charged with arson (Gallaher 295). Despite being heavily armed with explosives and guns while unlawfully occupying a government building, the protesters did not attract much attention from law enforcement or national media. During much of the protest, the atmosphere at Malheur was cordial; law enforcement personnel at the scene allowed the occupiers to come and go without interference, and journalists interviewed members of the Bundys' group, providing them with a platform to explain the land-use issue to a national audience (Gallaher 294).

Over six months after the Malheur National Wildlife Refuge protest, another demonstration on the other side of the country also made headlines; this time protesters were responding to the law-enforcement shooting of an unarmed black man. On September 20, 2016, officers from the Charlotte-Mecklenburg Police Department arrived at an apartment complex in the city to serve an arrest warrant. Instead, the officers noticed Keith Lamont Scott, a man who, according to the officers, possessed marijuana and a handgun (Fausset and Blinder). After the officers approached Scott, they perceived him as a threat to their safety and fatally shot him. While the officers claim that their actions were justified as Scott was holding a gun, there has been no evidence provided to validate the claim (Fausset and Blinder). Scott's family members argue that he was reading in his car at the time. The shooting of Keith Scott led to numerous protests throughout the city of Charlotte. The demonstrators acted to express their outrage with Scott's death and with previous police shootings of unarmed black men. The combination of increased law enforcement presence and property damage resulted in clashes between protesters and police officers, who fired tear gas to quell the demonstrators (Fausset and Blinder).

Literature Review

Previous research has shown that the framing of demonstrations similar to those in Harney County and Charlotte typically does not align with the agendas of protesters and can negatively impact public opinion. The article "From Protest to Agenda Building: Description Bias in Media Coverage of Protest Events in Washington, DC" argues that while protest movements seek to attract attention to a larger issue, their goals can be lost if the media

frames the coverage in ways that undercut the intention of the protest. When describing the implications that media framing has on a social movement, the authors state that the media

> will marginalize social movement agendas by, for instance, framing stories in a way that personalizes, de-contextualizes, or dramatizes them . . . by emphasizing the drama of a protest event rather than the substance of protester critiques, the mass media encourage shallow understandings of these issues and discourage the critical engagement of audience. (Smith, McCarthy, et al. 1403-1404)

The episodic framing of demonstrations as described in the study can cloud the central issues of a protest. When the media concentrates on a singular event instead of the central social problem protesters are attempting to address, description bias occurs. This description bias affects the type of narrative surrounding a protest and has the ability to influence public opinion on that protest.

When analyzing the Occupy Wall Street demonstrations of 2011 and 2012 in his article "Protest News Framing Cycle: How *The New York Times* Covered Occupy Wall Street," political scientist Julian Gottlieb describes the protesters' fight to attract coverage and the way media frames this fight. Gottlieb's research "indicates that protesters can make their issues more salient in the news by escalating conflict and getting arrested, but that journalists tend to focus on the conflict instead of the protest issues" (18). Gottlieb concludes that the more conflict there is in a demonstration, the less likely journalists are to focus on the substance of the protest, resulting in description bias (18). Coverage that focuses on arrests during a demonstration is an example of episodic framing, which can counteract protesters' initial goals of attracting media attention to the issues they are protesting.

Methodology

To research description bias in media framing, I examined news articles from the *Wall Street Journal*, a right-leaning news source, and *The New York Times*, which is left-leaning. I chose these two newspapers because they attract a significant national audience and represent opposite sides of the political spectrum. To find articles from these news sources, I queried the *ProQuest U.S. Newsstream* database. I used the keywords "wildlife refuge" and "protest OR occupation" to conduct my search for articles covering the Malheur National Wildlife Refuge protest. I examined articles from January 2, 2016, the start date of the protest, until January 21, 2016. I used the keywords "Charlotte," "protest OR riot," and "Scott" to search for articles on the Charlotte protests. I searched for articles within the date range of September 20, 2016, the date of Scott's death, through September 24, 2016, the day after the second night of protesting.

While analyzing each news article, I used Iyengar's definitions to establish whether an article contained a thematic or episodic frame. To determine if an article contained a certain

frame, I examined each passage to see if a majority of them possessed an episodic or thematic frame. If most passages discussed the protest itself or the direct cause of the protest, the article was labeled "episodic." If most passages referred to the historical context or underlying societal issues of each protest, the article was categorized as "thematic." While media coverage can exhibit a balance between the two frames, most articles in the study did not achieve this balance. Journalists may mention the history of a movement in episodic articles, but if the focus of the article is primarily on the unfolding events of a protest, it does not serve the same purpose as a thematically framed article.

Results and Discussion

Table 1 *Mainstream media framing of the Malheur protest*

Newspaper	Total Number of Articles	Articles with Episodic Frame	Articles with Thematic Frame	Articles Excluded
New York Times	17	3	10	4
Wall Street Journal	4	0	3	1

My search for articles on the Malheur National Wildlife Refuge protest generated 21 results, including 17 articles from the *New York Times* and four from the *Wall Street Journal*. Of those articles, three were presented in an episodic frame and 13 contained a thematic frame. I excluded five articles from my results as they did not provide sufficient coverage of the protest itself or the context of the protest, so they had neither an episodic nor a thematic frame of the event. Of the remaining articles published in the *New York Times*, less than one-fourth were presented with an episodic frame and the rest were presented with a thematic frame. By contrast, the *Wall Street Journal* provided no articles with an episodic frame, covering the protest in an entirely thematic frame.

Table 2 *Mainstream media framing of the Charlotte protest*

Newspaper	Total Number of Articles	Articles with Episodic Frame	Articles with Thematic Frame	Articles Excluded
New York Times	14	7	2	5
Wall Street Journal	6	2	2	2

My search for the Charlotte protest news articles produced 20 results, with 14 from the *New York Times* and six from the *Wall Street Journal*. Of the articles, nine contained an episodic frame and four had a thematic frame. Again, I excluded seven articles from my results as they did not focus on either the protests, context, or underlying issues of the event. Of the articles published by the *New York Times*, over three-fourths contained an episodic frame and the rest exhibited a thematic frame. The *Wall Street Journal* covered the protests evenly, with two articles presenting a thematic frame and two articles containing an episodic frame.

There were several differences in how each of the publications covered the two protests. Firstly, the *New York Times* provided more coverage of each event. The *New York Times* also provided a greater proportion of episodic coverage to the wildlife refuge protests than the *Wall Street Journal*, which reported on the occupation in a solely thematic frame. Yet both newspapers reported on the issue with mostly thematic framing. The *New York Times* chose to report on the Charlotte protests with a primarily episodic frame, while the *Wall Street Journal* provided more equal framing. However, in one of the two articles containing a thematic frame, the journalist sympathized with police officers in portraying the issue of police brutality, and thus undermining the goals of the protesters.

The results of the study show that the media exhibited description bias in the coverage of the Malheur National Wildlife Refuge and Charlotte protests. The publications favored the wildlife refuge protesters by drawing more attention to the issue they were protesting than the protest itself. In contrast, the Charlotte protests were presented in an episodic frame, and coverage often unfairly ignored the issue the protesters were attempting to bring to the public's attention.

A large portion of articles that covered the Malheur National Wildlife Refuge protests tended to provide sympathetic and holistic coverage of the event, a result of favorable description bias. In the article "Protest Rooted in Land-Use Dispute," *Wall Street Journal* writers Jim Carlton and Dan Frosch report in depth on the protesters' dispute with the federal

government that led to their takeover of the wildlife refuge. The authors choose to cover the history of land-use disputes that resulted in the occupation of the Malheur National Wildlife Refuge, giving the coverage of the event a thematic frame. Carlton and Frosh begin their article by stating:

> Behind the armed protest at a national wildlife preserve in Oregon lies a decades-long struggle between agencies that manage vast tracts of federal land in the West and the ranchers, loggers, and miners who depend on access to them for their livelihoods.

By diverting from an explanation of the protest itself and instead describing the historical context leading up to the confrontation, the authors give a more thematic overview of the land-use issue than that which an episodic frame would cover. Iyengar explains that when events are described using a thematic frame, "attributions of responsibility . . . were societal in focus" (256). This is evident in the article's focus on government encroachment on land in the West and its impact on ranchers rather than describing the demonstration. Attributing responsibility for the protests to the government tacitly absolves protesters of the crime of their armed occupation and makes the public more likely to sympathize with their cause, contributing to the effectiveness of the movement.

The *New York Times* article "Why the Government Owns So Much Land in the West," by Quoctrung Bui and Margot Sanger-Katz, is another example of thematic framing as it provides a comprehensive description of federal land ownership and the issues that antigovernment protesters at the Malheur National Wildlife Refuge were fighting. The depth of the explanation given by Bui and Sanger-Katz provides the demonstrators with the attention they are seeking through their protest. The authors recognize that the "remaining ownership and management of large tracts of forest and grazing lands is the core problem for antigovernment protesters in Oregon" (Bui and Sanger-Katz). By answering anticipated questions of the readers on the context and root causes of the protest, Bui and Sanger-Katz approach the issue with a thematic frame. The thematic frame, as Iyengar points out, "directs the viewers' attention to alternative and more contextual accounts" (257). The frame presented by the authors allows readers to understand the reasons why the protest is occurring, making them more likely to blame the federal management of land rather than the protesters themselves.

Most articles covering the Charlotte protests contained an episodic frame, a direct result of description bias. In Valerie Bauerlein's article, "Man Shot, State of Emergency Declared as Charlotte Protests Continue," the *Wall Street Journal* reporter summarizes the events of the second night of protests in Charlotte after the death of Keith Scott. By focusing on the specifics of the demonstrations, Bauerlein frames the conflict episodically. She details the protests by stating, "Violent protests continued toward midnight Wednesday in the central business

district. Windows at restaurants and major hotels were smashed, and police in riot gear sought to regain control of the streets" (Bauerlein). The dramatic description and lack of context for the demonstrators' motives results in an episodic frame, which Iyengar described as "typically . . . dramatic" (255). He also notes that, in this type of framing, "viewers [attribute] responsibility not to societal or political forces but to the actions of particular individuals or groups" (Iyengar 256). Through this episodic frame, the public is more likely to focus on the activity of the demonstrators rather than focusing on the systemic racism responsible for the protests. Since movements are often reliant on support of the general public to achieve their goals, conflict framing can pose a significant barrier to the movement. If Black Lives Matter protests continue to be depicted using language that emphasizes conflict, for instance, the narrative of the movement will be shrouded by negative public perception.

The *New York Times* article "More Violence Hits Charlotte After Shooting," by Richard Fausset and Alan Blinder, is another example of description bias through the creation of an episodic frame. The article describes the aftermath of the shooting of Keith Scott and the resulting protests in Charlotte. The frame is evident throughout the article, including the opening line:

> A second night of protests set off by the police killing of a black man spiraled into chaos and violence after nightfall here Wednesday when a demonstration was interrupted by gunfire that gravely wounded a man in the crowd. Law enforcement authorities fired tear gas in a desperate bid to restore order. (Fausset and Blinder)

Emphasis on the chaotic details of the protest is often found in episodic frames and distracts readers from focusing on the larger issue of police brutality. As Iyengar notes, when episodic frames are evident, "viewers [focus] on individual and group characteristics rather than on historical, social, political, or other general forces" (256). In this case, the article diverts the attention of the readers to the Charlotte protesters rather than the issue of police brutality. Not only are the protesters portrayed negatively in this situation, but the law enforcement officials at the scene are viewed through a sympathetic lens with language that paints their efforts to deescalate the situation as "desperate." The combination of contrasting depictions of activists and officers with an episodic frame serves to limit the effectiveness of the protest. The frame detracts from the overall message of the Charlotte protest, creating unfavorable description bias.

Conclusion

The results of my study demonstrate that the US mainstream media exhibited description bias in their framing of the Malheur National Wildlife Refuge and Charlotte protests. It might be prejudicial for media outlets to cover protests with a completely thematic frame that always aligns with the goals of the protesters. And yet the media did exhibit prejudice by framing a majority of the Malheur protest articles thematically while giving little attention to the issues that resulted in the Charlotte protests. There are several possible reasons why there was a disparity in the coverage of these protests. One of the most glaring differences is the level of conflict in both events. As Gottlieb noted in his research, protests that attract police presence or escalate to conflict often lead the media to focus on the conflict itself, resulting in an episodic frame (4). The racial disparity between the two groups of demonstrators is one possible explanation for the policing differences in the Malheur and Charlotte protests. Black protesters are more likely to receive law enforcement presence at their demonstrations, which increases the rate at which their protests are reported in an episodic frame (Davenport et al. 168). Davenport's argument may explain why articles covering the Charlotte protests were more likely to contain an episodic frame. The Malheur protesters, who were mostly white, attracted very little police presence, which may have favorably contributed to the primarily thematic frame of the demonstration. There are, of course, other factors that could have contributed to the disproportionate framing between the two protests. Since the Malheur protest lasted over six weeks, there were times during which nothing eventful happened. Additionally, the Black Lives Matter movement had frequently been in the news due to the volume of law-enforcement-related shootings so the unfolding protest events were new to the public consciousness while the underlying issues were not, which could provide motivation for framing the demonstrations episodically. The urban setting of the Charlotte protests in comparison to the secluded wildlife refuge in Harney County also meant the Black Lives Matter protests more directly affected the general public. Yet none of these factors justify the fact that the Malheur protesters, who staged a heavily armed takeover of a government-owned building, did not receive coverage consistent with the severity of their actions.

While the coverage of the Malheur protests brought the issue of federal land-use laws to the general public's attention, the narrative of the Charlotte protesters was lost in the absence of substantive content covering the systemic injustice of policing that is biased against people of color. The racial disparity of the issues is hard to ignore, as the Malheur protesters were acquitted of all charges brought against them, despite the armed occupation (Bernstein). The whiteness of the protesters, in combination with the lack of strong media criticism, may have influenced how the protesters were treated in the legal system. Meanwhile, police brutality remains unresolved, especially considering that the police officer who killed Keith Scott was recently cleared of all charges (Swaine). If the public perception of the Black Lives

Matter movement had been more positive, there may have been harsher consequences for the officer involved and for all instances of excessive use of police force. Although equitable media coverage of protest events will not entirely solve systemic issues, an attempt from the US mainstream media to eliminate description bias from their framing of protests will be necessary to enact lasting change.

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Short Communications

Design and Fabrication of a Prototype Coupler Component to Facilitate the Concurrent Collection of Mixing Chamber and Breath-By-Breath Metabolic Measurements

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Introduction and Problem Statement

Metabolic measurement systems, or devices that analyze the capacity of the human body to do work via respiratory system function, are a key tool in the field of sport and exercise science research. Most modern systems employ an open-circuit spirometer design that analyzes exhaled air. There are various configurations of open-circuit spirometers currently in use today. Two of the more common configurations are mixing chamber analysis and breath-by-breath analysis. Both classes of system are widely used and produce reliable results, but they each have distinct strengths and weaknesses that make them more appropriate for different settings.

Figure 1 *Parvomedics TrueOne 2400 integrated metabolic measurement system. Test subject running on a treadmill, 2017, wearing the snorkel like mask (a) which connects to the mixing chamber on a cart (b) via the connecting hose (c).*

Mixing chamber analysis functions by directing the air exhaled by a research subject into a chamber that combines several breaths before analyzing the large sample for its constituent gas concentrations. This well-respected technique has been widely used for years. The Parvomedics TrueOne 2400, shown in Figure 1, is an example of this type of system. The Parvomedics TrueOne device is comprised of a snorkel-like mouthpiece connected to a two-way valve (labelled "a" in Figure 1), which allows a subject to breathe in fresh air and then directs the subject's exhaled breath to the mixing chamber and sensors (labelled "b" in Figure 2) via a connected hose. The Parvomedics TrueOne 2400 and other mixing chamber systems provide accurate and precise information for researchers in a laboratory setting.

The second and more recently developed class of systems use a breath-by-breath analysis technique. These systems use sensors placed directly on the subject's body to collect data on each breath taken by the subject, providing instantaneous metabolic information. Figure 2 displays the Cosmed K4b2 system, which employs this technique for taking indirect calorimetry measurements. The system collects flowrate data for each inhale and exhale with a small turbine located inside of a mask (labelled "a" in Figure 2) worn by the subject. The K4b2 system also has an air sampling tube that directs a small amount of air from each breath into a sensor package (labelled "b" in Figure 2), typically worn on the subject's body, that collects instantaneous gas concentration information on each breath taken by the subject. The Cosmed system is portable and can be used outside of the laboratory setting if desired.

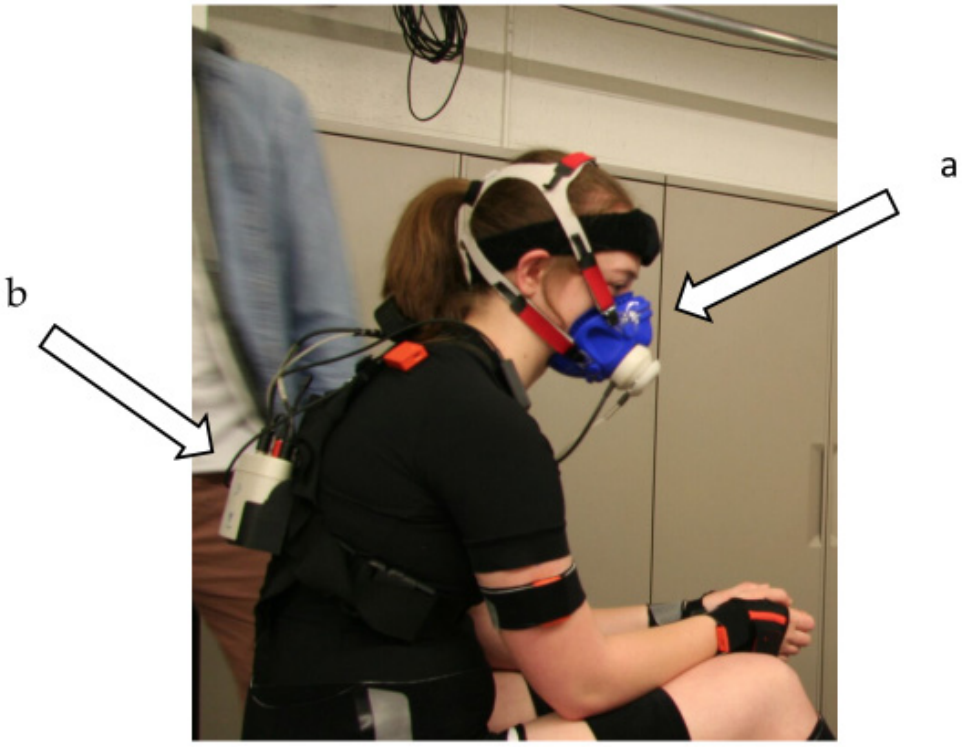

Figure 2 *Test subject wearing the Cosmed K4b2 pulmonary gas exchange measurement system, 2017. The mask (a) contains tubing that samples small volumes of air, which are analyzed in the wearable device (b).*

As previously stated, both types of systems have their uses, and the relationship between the qualities of information they collect is an area of active research (see Crouter 2006; Stroud 2009; Welch 2015). These particular studies are focused on comparing the validity of the data collected by the two types of metabolic systems in similar circumstances or using the same subjects in order to validate the usage of the breath-by-breath systems in lieu of the laboratory-based mixing chamber system. To date, there have been no attempts to collect information using both systems simultaneously on a single subject. This type of information could be very useful since the mixing chamber system and breath-by-breath systems collect

information in fundamentally different ways. Data collected from both systems simultaneously could even show trends that support the use of one system over the other. Sport and exercise science researchers at Seattle University are interested in collecting just this type of information. However, fitting an exercise subject with both a breath-by-breath system and a mixing chamber system presents a key mechanical system design problem.

The critical issue, from a mechanical component point of view, is to discern how the two data collection systems can be mounted to a subject simultaneously while ensuring that the systems function as designed. The remainder of this paper will present the details of this mechanical component design problem and the solution devised by researchers in the Mechanical Engineering Department at Seattle University with the use of computer-aided design tools and 3D printing technology.

Design Problem

In order for a subject to use both the mixing-chamber TrueOne 2400 and the breath-by-breath K4b2 systems simultaneously, they must wear the data collection assemblies for both systems (labelled "a" in both Figure 1 and Figure 2) in such a way that air flows through both systems. Figure 3 shows the basic layout of the TrueOne 2400 data collection components and how air flows through the system. Note that air enters the system through a one-way check valve, moves in and out of the subject's lungs, and then flows out of a second port, through a hose, and into the mixing chamber that has sensors located on a nearby cart. The relevant K4b2 system components are shown in Figure 4. In this system, the air that a subject inhales is drawn from the outside environment and flows through an air sample tap and a small turbine prior to entering the subject's lungs. Then, when the subject exhales, the air flows back through the turbine and air sample tap, allowing for the collection of a second set of data on the same breath.

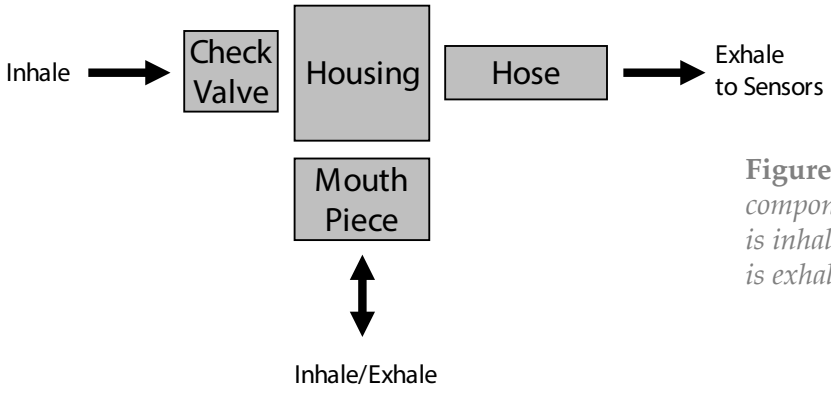

Figure 3 *Relevant TrueOne 2400 components. Air enters the system (a), is inhaled by the subject (b), and then is exhaled to the sensors (c).*

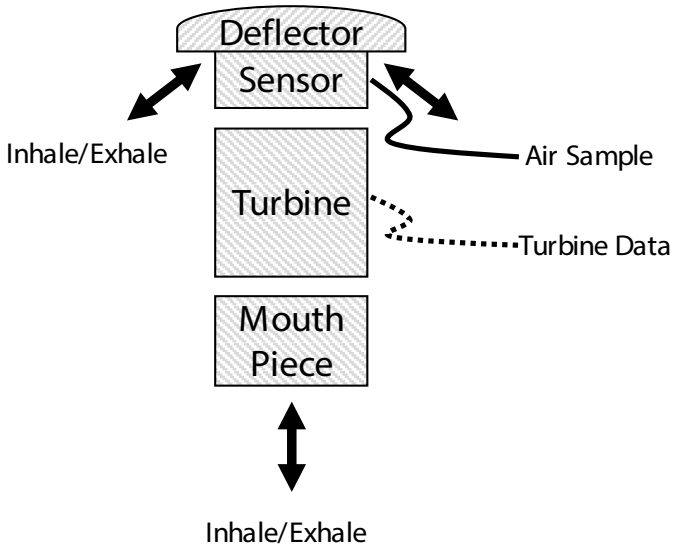

Figure 4 *Relevant Cosmed K4b2 components. Air enters the system (a), samples are taken (b), turbine data is collected (c), the air is inhaled and exhaled by the subject (d), and then passes back through the system.*

To combine these two systems for simultaneous data collection, it is necessary to allow for breath-by-breath data collection, isolating the inhaled air sample and directing all exhaled air to the mixing chamber and sensors. The proposed solution to this problem was to design a mechanical coupler that will allow for the mounting of the TrueOne 2400 valve and hose assembly onto the end of the K4b2 turbine. This physical coupler essentially connects the breath-by-breath data collection to the mixing chamber system. Figure 5 depicts this proposed coupled system, featuring a new component that facilitates the attachment of the two systems. In this coupled system, inhaled and exhaled breaths are isolated and sent to the mixing chamber, but analyzed on a breath-by-breath basis as well. Note that this new coupled system is designed purely for laboratory use.

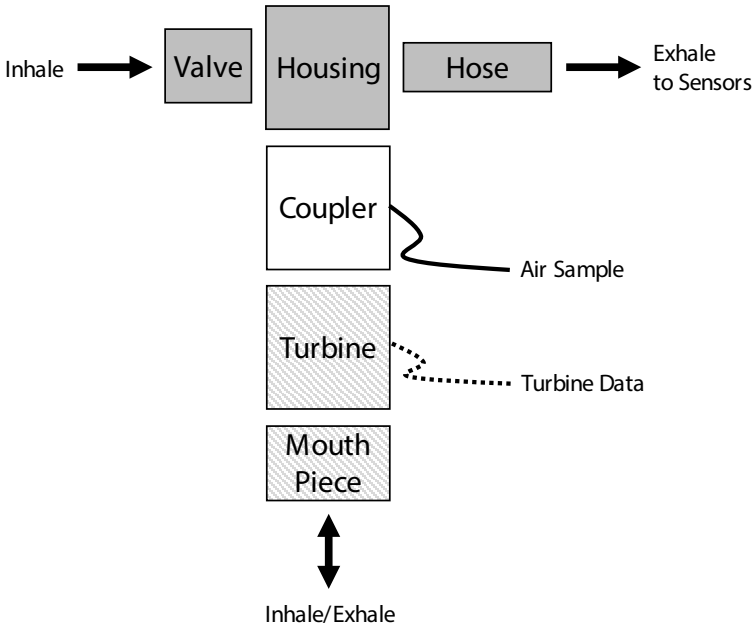

Figure 5 *Proposed coupled configuration. Air enters the system (a), samples are taken (b), turbine data is collected (c), the air is inhaled and exhaled by the subject (d), and then the exhaled air travels back through the system to the sensors (e).*

The key challenge in implementing this proposed solution is the fact that the coupler component does not exist and must be designed and fabricated in order to test the feasibility of this concept. The following requirements for this coupler component were determined jointly by sports and exercise science and mechanical engineering researchers.

1. The device should be a solid object that does not impede air flow.
2. The device should be as small and light as possible for ease of use.
3. The device should be as air-tight as possible to ensure quality of results.
4. The device must mount to the TrueOne valve assembly via the correct threaded fitting.
5. The device must mount to the K4b2 turbine via the correct press-lock fitting.
6. The device must contain a small hole and mount for attaching the K4b2 air sample hose.

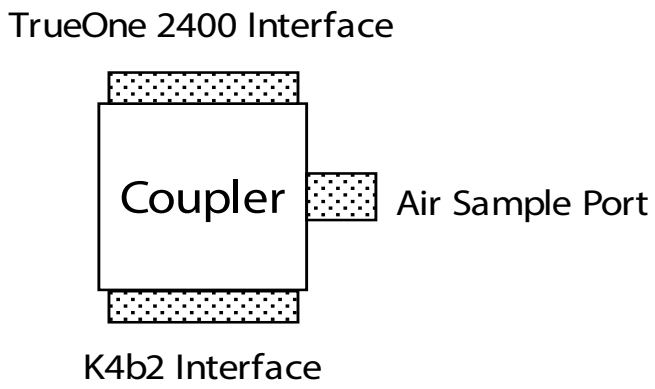

Figure 6 *Proposed coupler concept. Key design interfaces: TrueOne 2400 interface (a), air sample port (b), and K4b2 interface (c).*

Figure 6 depicts a basic conceptual design of the proposed coupler object. In Figure 6, note that the three interfaces on the coupler, also described as the attachment sites of the TrueOne 2400 and K4b2 components, are critical elements of the design.

Design Process and Prototype Solution

With the necessary requirements clearly established, mechanical engineering researchers set out to make a rough model of the coupler by taking measurements of the relevant TrueOne and K4b2 interface components. Since the attachment interfaces for each system are unique and published dimensions are not available, it was necessary to back-engineer most of the features to ensure that the coupler would have an exact fit. Once measurements were obtained, a solid model of the coupler was developed in a computer-aided design (CAD) tool called Solidworks (3D CAD Software 2015). Prototypes of the coupler designs were then fabricated with a 3D printer located in Seattle University's 3D-Printing Lab, using polylactic acid (PLA) plastic filament and the Fused Deposition Modeling (FDM) fabrication process (Gibson, Rosen and Stucker 2014).

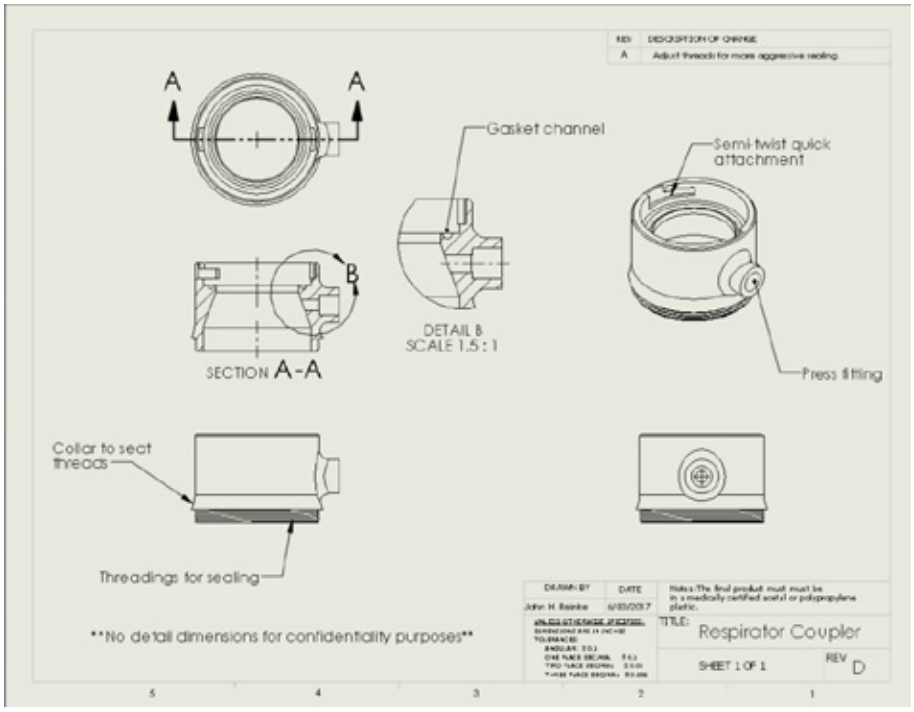

Figure 7 *Engineering drawing of the final coupler prototype.*

After an initial prototype was fabricated, the coupler was fitted to the relevant TrueOne and K4b2 components, necessary adjustments were noted, the CAD model was revised, and another prototype was produced. This process was repeated multiple times with several small changes made to the design for each successive prototype. Certain interface features were quite a challenge to recreate, and the threading required to connect to the TrueOne component presented a particular challenge. Without information available on the exact thread pattern used by the TrueOne valve assembly, it was necessary to estimate the pitch and threads per inch of the device and determine the correct geometry via a trial and error process. A total of six prototypes were printed over the course of the design project to develop a coupler with a correct fit. Figure 7 is an engineering drawing of the final coupler prototype shown in Figure 8.

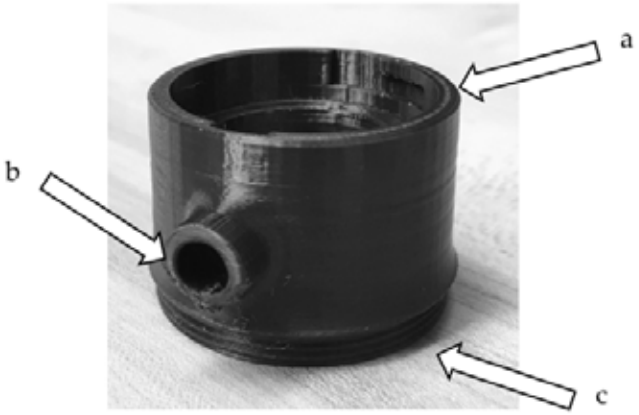

Figure 8 *Isolated photo of final coupler prototype (2017). Key design features: K4b2 connection interface (a), press-fit air sampling port (b), and the TrueOne 2400 threaded-interface (c).*

Preliminary Results and Recommendations for Future Work

Once a prototype coupler design was produced, preliminary testing of the coupled operation of the two metabolic systems was conducted. These tests evaluated three metrics for each system: the volume of air exhaled per minute (VE), and the concentration of expired O2 and CO2 (FeO2, FeCO2). Preliminary results from this proof of concept testing suggest that the coupled system shows differences between the Cosmed K4b2 and the Parvomedics TrueOne 2400. Differences between the two systems are not unexpected (Stroud L.C., 2009). As Macfarlane explains in his 2001 review on automated systems, studies have observed differences in these metrics across the various systems that are commercially available (Macfarlane, D. J., 2001).

Additionally, researchers were concerned with the coupler device's mechanical operation in two ways. The first concern was that the 3D printed plastic might be porous and could leak air if pressures are high enough. Preliminary flowrate data from the coupled system does not show any significant drops when compared to the operation of the K4b2 in stock configuration. If air was leaking, a drop in flowrate would be expected. The second concern was related to the K4b2's air sampling line drawing air at a high enough rate to significantly alter the measurements taken by the TrueOne system, which operates downstream of the K4b2 in the coupled configuration. However, preliminary data does not show a reduction in air volumes measured by the TrueOne system when running in the coupled configuration as compared to the stock configuration.

The preliminary qualitative results suggest that the coupler is functioning as desired, and that the coupled system allowing for simultaneous mixing chamber and breath-by-breath analysis has the potential to collect novel sports and exercise data. These results are quite encouraging and suggest that a formal study of the new coupled system should be pursued to rigorously evaluate the function of the new coupler design.

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Author's Note

My 12th grade humanities class, *Citizenship and Social Justice*, eagerly absorbed lessons on poverty, feminism, racism, and ableism. We discussed city and state budgets and dissected speeches and literature. We learned from guest speakers, field trips, research, community partnerships, and student-led lessons. We were no longer passive students, bored and disinterested, waiting for the bell to ring. Through gripping lessons and hands-on service learning, our teacher empowered us to positively impact our world.

Before this class, I had participated in several service learning projects. This experience, however, was different. Not only had my teacher established partnerships with community organizations doing work related to our curriculum, but he'd also designed his curriculum to be responsive to our community and its needs. In that humanities class, we were learning from voices we respected. We discussed work we had both read about and participated in firsthand. Our class gave us the opportunity to hear from the director of the Health and Human Services Coalition, visit social service organizations, and research sources for additional funding. At the end of the year, we excitedly celebrated the Seattle City Council's recently approved budget. The passed budget was tangible evidence that our class was making a difference in the community. Unlike my more traditional classroom experiences, I could recall everything I had learned. Most importantly, I could explain why it mattered. Now as an aspiring middle school teacher, I want to provide a similar education for my future students—so that they too, can see the connection between their classroom and their community.

Introduction

The primary objective of middle school education is to provide a safe and supportive learning environment, while preparing students to become thoughtful citizens in an ever-changing world. Teaching social and emotional learning, including strategies for problem-solving and critical thought, must be prioritized alongside traditional subjects. One method proven effective in achieving quality middle school education is to blend service learning into the curriculum by integrating elements of core subjects, social and emotional learning, and citizenship. Engaging in community-centered service learning can help students to develop skills for handling and responding to interpersonal relationships, stress, and the world outside the school building. Service learning could revolutionize how we prepare students to become compassionate global citizens.

However, while service learning offers numerous benefits to students and partner organizations, it may become a burdensome challenge yielding suboptimal results. How to successfully implement a middle school service-learning program that benefits both the students and the community partner is a complex problem requiring interdisciplinary attention.

My research follows the Broad model of interdisciplinary research, as established by Repko and Szostak (2017). I consider two disciplines in my work: educational psychology and community studies. In the first section, I will focus on the combined discipline of educational psychology, an increasingly prevalent graduate-level program. Educational psychology provides insight into existing middle school service learning programs and the social-emotional, educational, and developmental benefits gained from participation in service. The second section centers on community studies, a field which draws from social work and sociology. Community studies offers tools needed to consider the perspective of partnering community organizations and guidance to establish effective school-community partnerships. Analyzing the two disciplines' perspectives reveals common ground between the fields. I will offer a framework for creating effective school-community partnerships by integrating the research from educational psychology and community studies. Finally, I will outline an example of a middle school service-learning project to demonstrate the framework in context.

Educational Psychology

This educational psychology section explores the ways service learning benefits middle school students. In order to achieve the best outcomes for each student, educational psychology notes that the focus must first be on establishing a healthy classroom environment prior to embarking on service learning projects. According to psychologists Richards, et al. (2013), service learning is "a way to engage students in the learning process by having them provide meaningful service to others, connect [the] experience with the students' academic curriculum, and, frequently, reflect on the process in some fashion" (p. 6). Service learning—often confused with community service, which is uncompensated work performed for the community's benefit—calls for intentionality and reflection. In schools, service learning builds upon classroom learning by adding a hands-on element. Richards, et al. (2013) found "service-learning programs had significant positive effects on participating students; students profited personally, civically, socially, and academically from participating in service-learning programs" (p. 6). Scholars and practitioners in educational psychology have found convincing evidence that service learning is beneficial to middle school students both at home and at school, now and in the future.

Across the United States, approximately 23,000 public schools implement service-learning programs of some kind. However, less than 10% of these programs target students below the ninth grade (Richards, et al., 2013, p. 6). Meanwhile, 59% of all service programs in the country are designed for college students (as cited in Richards, et al., 2013). My research focuses on middle school service learning in the hope of expanding the currently limited scholarship on that age group.

Classroom Climate

Prior to implementing a service-learning program, it is essential to establish a supportive classroom climate. Students must trust their peers and instructor. They must also see the classroom as a place where they can be vulnerable as they grapple with challenging topics and societal problems such as homelessness, hunger, or poverty. According to developmental researchers, teachers must be models for their students. They must teach by setting an example of active citizenship, contemplation, and curiosity (Bayram-Özdemir, Stattin, & Özdemir, 2016). Educational psychologists Guillaume, Jagers, and Rivas-Drake (2015) studied student perceptions of teachers and found that "when students feel they attend a school in which adults are supportive and in which their peers enjoy getting to know each other and working together, they are more likely to feel they themselves are part of, happy, and close to others in the setting" (p. 328). With a safe and engaging classroom climate established, students are prepared to participate in service learning under the direction of their teachers.

Academic Engagement

Involvement in the local community is found to increase school connectedness, academic self-efficacy, and perceptions of school climate (Guillaume, 2015). For instance, fewer conflicts between students and higher grades are reported in schools where students are engaged in community service. Further, community involvement led to students having more positive views of both their school and community. Service learning also helps students sustain their interest in academic subjects. When math students tutored younger students in the subject, it was found that the older students took greater interest in their own math studies (Banks, 2015; Hutzel, Russell & Gross, 2010; Reed & Butler, 2015). When students see real-world connections to their classwork, the material comes to life. Thus, students take greater interest in their studies, teachers see improvements in grades, and parents see prosocial behaviors develop (Richards, et al, 2013).

Adolescent Development, Health, and Wellbeing

McBride, Chung, and Robertson (2016) find service learning has a positive influence on middle schoolers' development. Middle schoolers benefit from support during the often-tumultuous physical, social, and emotional changes of adolescence. McBride, et al. (2016) studied how a social and emotional learning (SEL) curriculum delivered through service learning could reduce middle school disciplinary incidents and increase engagement in academics. SEL is defined as:

> the process through which children and adolescents enhance their ability to incorporate thinking, feeling, and behaving to achieve important life tasks. These skills include

> recognizing and managing emotions, developing caring and concern for others, establishing positive relationships, making responsible choices, and handling challenging situations constructively and ethically. (McBride, et al., 2016, p. 372)

When students have greater social and emotional skillsets, their futures are healthier overall. Adolescents involved in service are less likely to engage in substance misuse, perpetuate violence, drop out of school, or become pregnant (Voight & Torney-Purta, 2013; Ludden, 2011). From these findings, service learning has clear benefits across all areas important to middle schoolers' academic and social wellbeing.

Lifelong Service

Middle school is an optimal time to introduce service learning. As "adolescence is a time of civic, career, and social exploration, this developmental period is well-suited for the initiation of service programs . . . and may particularly benefit youth in early adolescence, during middle school years" (Richards et al., 2013, pp. 7-8). Civic engagement during adolescence is formative for habits exhibited in later life: nearly half (44%) of adults who perform service started as adolescents. Further, adolescents who engage in service are twice as likely to do so during adulthood (as cited in Richards et al., 2013). Today, many adults have negative connotations with their middle school experiences. From Richards's findings (2013), perhaps adults would feel more positively about their middle school experiences if instead they could recall the start of their service to others and the positive school environment it had fostered.

Community Studies

However, the many positive results for adolescent students and their schools from service learning may eclipse the key objective of service learning: to address identified needs of the community partners and their service recipients. If a partnership is to be mutually beneficial, it is critical to consider the perspective of the service partner in this conversation. The emerging discipline of community studies, encompassing social work and sociology, represents the needs of the community organization in the analysis of middle school service learning.

Community Impact

Service learning positively impacts not only the school community, but also the communities reached by service. Chupp and Joseph (2010) write "maximizing the impact on the local community requires engagement of community members, not merely as recipients of the service, but as partners in the design, implementation, and assessment of the activity" (p.

209). This approach stresses the importance of community organizations as deeply involved partners throughout the teacher's planning of the service-learning curriculum. A strong partnership between the educator and the partnering community organization is important. It ensures the best possible service learning experience for the students and community served, but it also confirms that both school and community organization are seen and heard.

Maximum Benefit

Political scientist Brenda K. Bushouse (2005) cites a framework for creating school-community partnerships. The framework values long-term, complex projects over short-term or one-off events. Divided into five categories, the levels of service learning are ranked from least to most valuable to community organizations:

1. One-time events and projects
2. Short-term placements
3. Ongoing placements, with mutual dependence between organizations
4. Core partnerships, with interdependence between organizations
5. Transformation, joint creation of work and knowledge (Bushouse, 2005, p. 32-34)

Deeper, sustained, and joint-guided efforts are the most highly valued to community partners. Less than 20 hours of service learning often lead to challenges in the eyes of community partners, who are skeptical about what can be learned or accomplished in such a short time. More critically, in some cases where young children are involved, sporadic or short-lived involvement could be harmful. However, with careful planning, many community organizations are eager to work with schools. For many organizations, the goal of creating a more just and humane world may be achieved through their involvement in the students' education.

Equal Partners

Service learning is impossible without the community partners. Therefore, it is essential to consider the needs, motivations, and perspectives of community organizations. Educators often portray community partners as the gateway for understanding another world or way of life outside of the school setting. For many students, their time spent with a community partner may be the first exposure to communities other than their own. Despite the known benefits of service learning, little scholarly attention is dedicated to the community side of the relationship. Education and community studies scholars Sandy and Holland (2016) conducted a case study of several community partners. Common themes emerged across the community partners. For example, the importance of "developing a mutually beneficial agenda, understanding the capacity and resources of all partners, participating in project planning, attending to the relationship, shared design and control of the project directions, and continual

assessment of partnership processes and outcomes" was frequently mentioned in the study (Sandy & Holland, 2006, p. 34). Of these priorities, all community organizations identified "aspects of valuing and nurturing the partnership relationship" as their top priority (Sandy & Holland, 2006, p. 34). In high-quality service learning, establishing an equal partnership between school and community organizations is of paramount importance.

Relationships and Commitment

In their responses, community partners identified the foundation of service learning: a relationship between school and community. In order to fulfill the goal of service learning—to learn from one another—community partners and schools must have an open, communicative relationship. Otherwise, the partnership is no longer centered on partners in service to each other. Instead, one group is performing an action for a recipient, more closely aligned to community service. Service learning requires both parties to be open and willing to receive the benefits and knowledge of each other's perspectives and experiences. Community partners "repeatedly stressed that educating college students was a more compelling reason for becoming involved in community-campus partnerships than more tangible 'transactional' short-term benefits to their agency or organization" (Sandy & Holland, 2006, p. 35). By this logic, work with middle school students can be equally rewarding for community organizations, particularly considering the possibility that many middle school students may be engaged with the organization for years to come. If teachers view community partners as co-educators, with a desire for greater input in partnerships and a role in shaping students' futures, teachers may regard service learning as less of an undertaking. They may see service learning as an opportunity to gain new ideas and approaches to engaging their students. Ultimately, both parties receive benefits.

Open Communication

Sociologists Blouin and Perry (2009) researched the benefactors of service learning impacts and how community organizations perceive service learning. The scholars noted that while partnerships between schools and community organizations typically yield favorable outcomes, there are routine barriers and challenges that can be anticipated in the process of establishing an effective and reciprocally beneficial partnership (Blouin & Perry, 2009). They identified three common barriers of service learning courses: "poor student conduct, poor fit between course and organizational objectives, and lack of communication between instructors and organizations" (Blouin & Perry, 2009, p. 132-133). Despite these obstacles, Blouin and Perry (2009) have hope for effective service learning when educators communicate clearly with students and community partners, and they carefully integrate service learning opportunities

based on community partners' missions into their curricula.

A New Framework for School-Community Partnerships

In the next interdisciplinary research method step, I will establish common ground between the disciplinary insights of educational psychology and community studies. Educational psychology identifies the benefits and risks associated with student involvement in service learning; however, it does not consider the impact on the partnering community organization. In contrast, community studies weighs the benefits and risks associated with a service-learning partnership for *both* parties involved.

Integrating the disciplinary insights, I have developed a new framework that considers the needs of both schools and community partners. Both parties should view this framework as a memorandum of understanding and use the questions posed to spur discussion throughout the planning process. The result of this framework is a meaningful partnership between school and community partner, in addition to high-quality, effective service learning for students.

Table 1

School-Community Partnership Framework

1: Intentions and Desired Outcomes

School: What curriculum must be covered? What does the school hope to achieve?	*Community Partner:* How must the organization's mission statement be followed? What does the organization hope to achieve?
School-Community Partnership: What is the school and community organization's collective interest or goal?	

2: Curriculum and Instruction

School: What background information will the teacher provide the students? Which classes will participate?	*Community Partner:* What information or instruction will the community organization contribute?
School-Community Partnership: How will school and organization collaborate and co-teach?	

3: Timeframe

School: How much time can be spent on service learning in each class and throughout the school year? How long will the project last?	*Community Partner:* How long does the organization hope to have involvement from school? What resources are available and when?
School-Community Partnership: How long will project/involvement last? Who will do what and when?	

4: Materials and Cost

School: What can the school pay for? What materials can the school provide? Can teacher/school apply for grant funding or receive donations?	*Community Partner:* What resources can the organization contribute (money, staff, volunteers, etc.)? Can the organization spend part of its budget on service learning?
School-Community Partnership: What will school and organization solicit together? What costs will be shared?	

5: Communication and Accountability

School: How often can the school/teacher meet with the organization? What can they be responsible for? What is the preferred communication format?	*Community Partner:* How often can the organization meet with the school/teacher? What can they be responsible for? What is the preferred communication format?
School-Community Partnership: How will both groups agree to communicate? Who is accountable for what project element(s)? How will issues or conflicts be solved?	

6: Outcomes

School: What is the final outcome for the school/students?	*Community Partner:* What is the final outcome for the organization?
School-Community Partnership: What is the final outcome for the community?	

Planting a community garden at a middle school is an example of a service-learning project that demonstrates the School-Community Partnership Framework. In their handbook on creating school community gardens, Arden Bucklin-Sporer and Rachel Kathleen Pringle (2010) describe how community gardens provide many of the desired outcomes of service

learning and healthy adolescent development. Gardens also deeply engage students: "Traditional classrooms are often tightly structured and regulated by a school's mandate to teach to the education standards . . . but by nature [school gardens] are dynamic educational settings that provide numerous opportunities to expand upon the standards." (Bucklin-Sporer & Pringle, 2010, p. 26). The authors argue that "by learning through action and through stimulation of *all* the senses, the school garden amplifies and enhances subjects covered in the traditional classroom. Gardens also teach students that learning may take place everywhere, and especially so out of the classroom" (2010, p. 26). Thus, lifelong learning is encouraged.

Lesson Topics, Guest Speakers, and Community Partners Guide

A community garden is but one example of countless excellent service-learning projects. The example of a community garden is used due to its widespread applicability, relatively low cost, and simplicity in transportation logistics, amongst other benefits. The following guide illustrates how middle school teachers and administrators could develop a service-learning program. The Lesson Topics, Guest Speakers, and Community Partners Guides (Tables 1 and 2) suggest possible topics to be covered in school-community garden curricula.

Core Subjects: In the humanities, teachers will establish an overview of the local community. They will address subject of food insecurity, lack of nutrition, and global hunger with a special focus on populations within the community particularly affected. The project will be introduced in the humanities when the community organization visits the classroom to present their work and potentially invite the class to visit the community site. The humanities will provide space for student discussion and reflection. In science and math, students will have the opportunity to apply mathematical and scientific tools to the service-learning project. Science classes will outline plant biology, photosynthesis, plant selection, succession planting, and garden care and maintenance with the help of experts from the community. Math classes will be responsible for creating the garden's design, outlining and measuring garden beds with algebraic and geometric formulas and community expert guidance. By weaving the service learning into each core subject, students will begin to understand how food insecurity may be analyzed and addressed through an interdisciplinary lens.

Table 2 *Core Subjects: Lesson Topics, Guest Speakers, and Community Partners Guide*

CORE SUBJECTS			
Subject	**Lesson Topics**	**Guest Speakers**	**Community Partners**
Humanities	□ Overview of food insecurity and local organizations involved □ Make a newspaper □ Interview food banks personnel □ Industrial revolution and farming technology	□ Community organizations fighting hunger and food insecurity (e.g. food banks, shelters, CSAs)	□ Community organizations responding to food insecurity □ Food banks □ Shelters □ CSAs
Science	□ Plant biology, photosynthesis □ Research plants: germination and fertilization, maintenance, harvesting □ Plant and germinate seeds □ Learn about succession planting □ Plant selection □ Compost □ Irrigation	□ Plant Biologist □ Botanist □ Gardener □ Landscape Architect □ Conservation Biologist	□ Seattle Tilth □ Nurseries □ CSAs □ Established Seattle-area community gardens
Math	□ Create garden design □ Measure and design raised beds and garden plots	□ Engineer □ Mathematician □ Architect □ Landscape Architect □ Urban Planner □ Gardener	□ Collaborate with guest speakers and community partners to create designs and plans for garden

Electives: Elective classes may find countless opportunities for involvement in a community garden. Health classes may study nutritional values of the fruits, vegetables, and herbs grown in the garden, or they may research implications of malnutrition due to hunger, poverty, or global conflict. Art or language classes may seek student leadership and community involvement to decorate and beautify the garden, which also contributes to students' school and community pride.

Table 3 *Electives: Lesson Topics, Guest Speakers, and Community Partners Guide*

ELECTIVES			
Subject	**Lesson Topics**	**Guest Speakers**	**Community Partners**
Health and Sciences	□ Nutrition, dietary needs □ Traditional medicine (herbs and teas) □ Nutrition pamphlets to discuss uses of, health benefits of, and recipes for produce and encourage healthy eating	□ Nutritionist, dietician □ Organic gardener □ Non-traditional medicine practitioner □ Environmental scientist □ Local utility staff □ Waste/recycling expert from local government □ Chef or restaurant owner □ Small business entrepreneur (maker of soaps, condiments, pickled vegetables, etc.)	□ Public Health/ Nutrition programs □ Agricultural college Extension programs □ Seattle Tilth
Art	□ Decorate and beautify garden □ Tiles with plant names □ Donor/sponsor acknowledgement □ Photography □ Design plant labels □ Garden design	□ CSAs □ Artists □ Ceramicists □ Printmakers □ Textile designers □ Graphic designers □ Landscape designers □ Nursery owners	□ Artists: make clay pots, stepping stones, mural, tiles □ Dye fabrics to sell as fundraiser □ Donate floral arrangements
Language	□ Multilingual plant identification tags/ signs; Latin plant names □ Write from perspective of plant, bird, etc. in garden □ Give instruction for caring for plants in languages	□ Translators/ interpreters □ Artists □ Writers □ Musicians	□ Artists: plant identification tags □ Local authors: produce multilingual poetry □ Pottery studio: make multilingual stepping stones, ceramics

Out-of-School Time

With the foundation of service learning established during daytime classes, out-of-school-time programming may provide enjoyable extracurricular activities, such as gardening or cooking. Students interested in further garden involvement may choose to participate in a garden advisory board to help plan and oversee decisions about the garden. Clubs surrounding these topics may be created for student involvement outside of the classroom. Further, community members may want to participate during out-of-school time and during school closures and summer months.

Conclusion

The beauty of interdisciplinary work lies in its ability to hear to all voices, recognizing that the strongest and most comprehensive solutions stem from collaboration between disciplines. Repko and Szostak (2017) write that the final product of interdisciplinary research—new and unique understanding—"should be inclusive of each discipline's insights but beholden to none of them" (p. 365). By drawing from disciplinary thinkers in the fields of both educational psychology and community studies, I can ensure that the perspectives of schools and community organizations are recognized. Informed by interdisciplinary research and methodologies, my School-Community Partnership Framework will guide practitioners to meet the needs of all involved, from students and staff to service users and service providers. Middle school service learning is a beneficial investment for schools and service organizations, while also contributing to the health of the local community. When service learning is launched within the school-community partnership framework, both organizations operate as equals and become open to gaining valuable knowledge. The teacher may be responsible for the students, yet the community partner is responsible for providing an enriched educational experience that the teacher could not provide in the classroom alone. By exploring their respective pedagogical philosophies and instructional strategies and coming to agreement on expectations for student conduct and adult mentorship, both institutions gain clarity and establish common ground. Neither the school nor the community partner will achieve worthwhile educational and community development results without the other.

My School-Community Partnership Framework leads to two outcomes. First, it guides each collaborator through the process of advocating on behalf of the needs and desires of the school or community organization they represent. Second, the framework brings both groups together, taking their once separate goals and intertwining them to establish a new and mutually beneficial common purpose. I do not intend for the framework's contents to be exhaustive or address every possible scenario. Instead, I hope this flexible framework will serve as a guide for conversation and curricular development between schools and community organizations.

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Full-Length Research Articles

Social Support as a Moderator for Stereotype Threat's Effects on Working Memory

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Introduction

Stereotypes have been shown to pose physical, emotional, and psychological threats to marginalized groups in a variety of social and political contexts (Najdowski, Bottoms, & Goff, 2015; Johns, Inzlicht, & Schmader, 2008). Ethnic minorities may serve as an example of a group that is disproportionately subjected to the harmful effects of stereotype threat within the workplace and academia. Controlled studies looking at stereotype threat have been modeled after real-world situations to gain a better understanding of established performance disparities among ethnic minorities (Schmader & Johns, 2003; Steele & Aronson, 1995).

The term stereotype threat was introduced by Steele and Aronson (1995) who demonstrated that Black college students performed worse on the Graduate Record Exam than white students when their race was emphasized. However, when race was not emphasized, Black students performed just as well and sometimes better than white students. These results were the first of many to exhibit that academic performance can suffer when students are aware that their behavior might be subject to racial stereotyping. Following Steele and Aronson's (1995) evidence of this performance disparity, Steele and Claude (1995) posited that stereotype threat redirects a student's attention from performing well on a test to the devaluing stereotype. As the gap in academic success between ethnic minority and white students continues to be of concern in modern Western society, research has begun to focus on the role of social support in improving performance. Dennis, Phinney, and Chuateco (2005) demonstrated that a lack of social support is predictive of college outcomes in ethnic minority first-generation students.

Stereotype Threat

Stereotypes are oversimplified images or ideas targeted at people who belong to a social group. According to Steele and Aronson (1995), stereotype threat refers to being at risk of confirming a negative stereotype about one's group through actions or behaviors. When ethnic minority students are faced with the pressure resulting from social comparisons—that are perceived as unfavorable—they have demonstrated performance decrements across a wide range of tasks. One account of this effect is that the cognitive pressure triggered by stereotype threats drains the same cognitive resources that are implicated in the respective task. The cognitive mechanisms that are associated with these performance decrements are not fully understood. However, there is converging evidence that stereotype threat interferes with academic performance, because it reduces an individual's working memory capacity (Schmader & Johns, 2003).

In 2013, the total college enrollment rate for white 18- to 24-year-olds in the US (42%) was higher than the rates for their Black and Hispanic peers (34%) (Musu-Gillette, Robinson, & McFarland, 2016). Many researchers have attributed this achievement gap to stereotypes

surrounding Black and Hispanic students having lower intellectual ability than their white peers. When a stereotype threat is present in an academic setting, it has been correlated with poor intellectual performance (Steele & Aronson 1995). Steele and Aronson (1995) originally found that they could induce stereotype threat in their study by simply having test-takers indicate their race on the test booklet, thus adversely affecting the performance of minority students on the Graduate Record Exam. Previous research confirms that stereotype threat offers a situational explanation for academic performance differences among various groups rather than inherent ability (Steele & Aronson, 1995). To contribute to the growing research on stereotype threat's effects and understanding of the cognitive mechanisms it targets within academic settings, we have explored working memory.

Working Memory

Working memory is a cognitive system of short-term memory that is responsible for our ability to focus our attention on temporarily activated information of interest while simultaneously inhibiting information that is irrelevant to the task at hand. Working memory capacity includes both the temporary storage of information as well as an attentional capability (Kane, Bleckley, Conway, & Engle, 2001). Particularly relevant to the study of stereotype threat, cognitive resources that dictate working memory capacity may be compromised when an individual is under stress. This occurs because the mental resources and energy that normally contribute to successful working memory function are instead surpassed by negative thoughts and emotions that disrupt one's ability to complete tasks (Klein & Boals, 2001). An individual indicating their minority status prior to a task (through a demographic questionnaire prior to an exam) can adversely affect their attention and thus their performance (Steele & Aronson, 1995).

Stereotype threat situations have been observed to disrupt working memory function by interrupting the targeted individual's ability to focus on the task at hand. According to Schmader and Johns (2003), stereotype threat can be conceptualized as a stressor when a negative social stereotype that is primed in a performance situation poses a threat to one's social identity. Researchers have identified *stereotype threats* as the biggest barriers to ethnic minorities' *academic* success (Robin, 2013). Therefore, understanding the nature of the cognitive disruption that stereotype threat causes— specifically the effects of stereotype threat on working memory capacity—is crucial.

The working memory system aids in the conceptualization of words and the ability to remember words for comprehension, contributing to areas such as reading achievement (Baddeley, 2003). In addition to reading, working memory performance has been connected with benefits in mathematics. Specifically, working memory is associated with the ability to retrieve arithmetic facts from long-term memory and maintain numerical representations

(Raghubar, Barnes, & Hecht, 2010). Therefore, prior research has established a connection between working memory and academic achievement.

The urgency to further understand stereotype threat is illustrated by prior research that repeatedly legitimizes the cognitive and emotional deficits one experiences when being exposed to stereotype threat. However, less is known about how to mitigate these negative effects. Research efforts to establish interventions that may reduce stereotype threat have investigated individual differences, mindfulness exercises (Weger, Hooper, Meier, & Hopthrow, 2012) and even retraining attitudes and stereotypes (Forbes & Schmader 2010). However, there remains a discrepancy between understanding an individual's response to stereotype threat and systematically alleviating stereotype threat.

Social Support

Perceived availability of social support resources may play a moderating role against the negative outcomes of stereotype threat on ethnic minority students. Previous research has consistently shown a positive relationship between social support and well-being, suggesting that social support acts as a buffer for life stress. Dennis, Phinney, and Chauteco (2005) investigated the role of peer support in the success of ethnic minority, first generation college students—a population that is traditionally subject to stereotypes about academic performance—and found that peer support was a strong predictor of academic achievement (2005).

Some of the most current research reveals a clearer picture of how social support works to reduce psychological stress that stereotype threat elicits. Hornstein and Eisenberger (2017) suggest that social support inhibits the formation of fear associations for other cues, allowing close relationships to override the activation of a fear response and allow optimal cognitive function to take place. This mechanism therefore has the potential to resist the deleterious effects of stereotype threat on working memory. Therefore, the demonstrated positive effects of social support may lead research in revealing its moderating effects on the working memory deficits of stereotype threat.

The Present Study

The present study seeks to investigate the relationship of a stereotype threat and race interaction with working memory on the campus of Seattle University, in addition to social support as a potential moderator for stereotype's negative cognitive effects. Our study aims to replicate past work to demonstrate the prevalence of stereotype threat at Seattle University and to then indicate a way to combat its effects through social support. Given a growing body of research we hypothesize, first, that ethnic minority students in a stereotype threat condition will do poorer on a working memory test than white students in a stereotype threat condition.

Furthermore, we hypothesize that there will be no significant difference in the working memory scores among ethnic minority and white students in the stereotype threat condition when high levels of social support are indicated.

Method

Participants in this study were undergraduate college students. Surveys were distributed to approximately 2,000 individuals on Facebook and 68 individuals in Seattle University classrooms. Each survey included a consent form inviting recipients to participate in the study, a demographic questionnaire, social support measure, and a working memory test. The study procedures were approved by the Department of Psychology Human Subjects Review Committee. Of the surveys distributed, 93 agreed to participate online (4.7% of those approached) and 68 (100%) agreed to participate in class. Of the potential participants, 14 were ineligible because they failed to complete the survey. The survey return rate was 7.1% (147 completed surveys divided by the number of surveys distributed, and excluding participants who did not complete the survey).

Demographic and descriptive information for the 147 survey respondents included in the current analyses are presented in Table 1. The current sample consists of 28 men (19%), 111 women (75.5%), and eight non-binary individuals (5.4%). The average age of our sample is 20.69 (SD = 2.53). The sample includes 1 American Indian or Alaska Native (0.7%), 28 Asian (19%), 3 Black or African American (2%), 7 Native Hawaiian or Pacific Islander (4.8%), 77 White (52.4%), and 31 participants who were multiracial (21.1%).

Measures

Demographic information

The demographic questionnaire assessed the following demographic variables: age, gender, education level, and ethnicity. We prompted the participants to indicate their racial identity given eight categories: American Indian/Alaska Native, Black or African American, Hawaiian, Hispanic, Caucasian, other, or decline to answer. Participants who selected multiple categories were assigned to the group, "more than one race."

Social Support Inventory

Survey respondents were administered a 12-statement inventory from the shortened version of the Interpersonal Support Evaluation List (Cohen, Mermelstein, Kamarck, & Hoberman, 1985). The Interpersonal Support Evaluation List has demonstrated high levels of internal consistency (*Cronbach's alpha =0.76*). Participants were asked to identify how true each of the statements was for them on a 4-point scale, with 1 = "definitely false" and 4 = "definitely true." This questionnaire consisted of three different subscales—Appraisal Support, Belonging Support, and Tangible Support—used to measure three dimensions of perceived social

support. All scores were kept continuous and the scale score was summed up to yield the total social support score for each participant.

Table 1 *Demographic and Descriptive Information for Participants (n = 147).*

Gender		
Man		28 (72.4)
Woman		111 (75.5)
Non-binary		8 (8.4)
Age (yr) (mean ± SD)	20.69 ±2.53	(range: 18-42)
Ethnic group (%)		
American Indian or Alaska Native		1 (0.7)
Asian		28 (19)
Black or African American		3 (2)
Native Hawaiian or Pacific Islander		7 (2.8)
White		77 (52.4)
Multiracial		31 (21.1)
Education (%) (highest level)		
Some high school		1 (0.7)
High school graduate or GED		3 (2)
Some college		134 (91.2)
College graduate		9 (6.1)

Stereotype Threat Manipulation

Participants were randomly assigned a stereotype threat or control condition on the Qualtrics survey and in class. Participants in the stereotype threat condition saw the statement: "You will now be asked to complete a short survey before taking a test that will determine the differences of working memory capacity between ethnic minority and white undergraduate students" prior to attempting the working memory test. Participants in the control, or no stereotype threat condition, saw the statement: "You will now be asked to complete a short survey before taking a test that will determine the working memory capacity of undergraduate students." The purpose of the stereotype threat statement was to raise concerns about possibly confirming negative stereotypes about the ethnic minority student group by increasing the salience of the stereotyped group identity. Because previous studies prompt students to indicate demographic information prior to the task, the collection of demographic information before eliciting the stereotype threat manipulation served as a countermeasure for ethnic minorities in the no stereotype threat condition (Steele & Aronson, 1995).

Working Memory Test

Participants had one minute to look at a list consisting of 25 words that were either projected on the screen of each classroom or on the page of the survey electronically, and were instructed to try to remember as many as they could. They then had one minute to list—on paper or electronically—as many words as they could recall. All scores were kept continuous and the sum of correct words recalled yielded the total working memory score for each participant. When investigating the deleterious effects of stereotype threat on memory, Schmader and Johns (2003) emphasized accounting for attentional capacity and storage or recall to test working memory. Therefore, our working memory test was informed by their prior research.

Results

Preliminary Analyses

Preliminary analyses included checking for necessary assumptions for our main analyses and checking for possible control variables. The necessary assumptions to run the ANOVA and ANCOVA to examine the differences between white and ethnic minority students' working memory when exposed to stereotype threat as well as while controlling for perceived levels of social support include: homogeneity of variance; that for each independent variable, the relationship between the dependent variable (y) and the covariate (x) is linear; homogeneity of regression slopes; and the covariate is independent of the treatment effects. Results of the point biserial correlation analyses revealed a non-significant relationship between race and social support ($r_{pb} = -.13$, $p > .05$); see Figure 1. Additionally, there was a non-significant relationship between race and working memory ($r = 0.05$, $p > 0.05$). However, a bivariate correlation analysis evidenced a significant relationship between social support and working memory ($r = 0.19$, $p < 0.05$). Therefore, social support was controlled for in subsequent ANCOVA analyses.

Hypothesis 1

A two-way ANOVA was conducted to examine the interaction between stereotype threat and race on working memory capacity. The results of the ANOVA are presented in Table 2. Preliminary checks were conducted to ensure that there were no violations of normality, linearity, or homogeneity of variances. The ANOVA revealed a non-significant interaction between stereotype threat exposure and race on working memory ability, $F(1, 143) = 0.11$, $p = 0.74$.

Mean differences in social support between white and ethnic minority students:

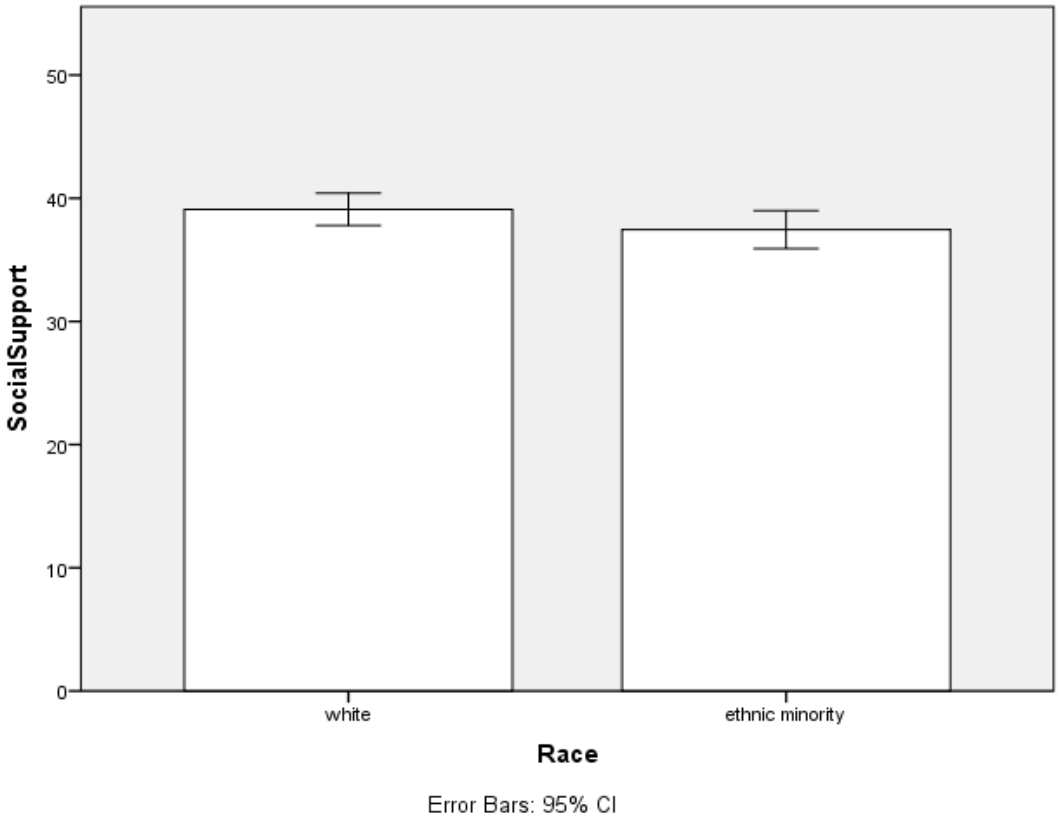

Figure 1 *Results of the point biserial correlation analyses revealed a non-significant relationship between race and social support.*

a. Pearson r correlation revealed no significant difference in the levels of social support participants reported based on their race (r = -0.13, $p > 0.05$).

Hypothesis 2

A two-way between-groups analysis of covariance was conducted to examine the impact of social support on the relationship between stereotype threat and working memory. The independent variables were stereotype threat and race, and the dependent variable consisted of working memory capacity. Participants' social support scores were included as the covariate in this analysis.

Preliminary checks were conducted to ensure that there were no violations of the assumptions of normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of the covariate. Running an ANCOVA model revealed homogeneity of regression slopes, indicating there was no significant interaction between the covariate, social support, and the independent variables, race and stereotype threat exposure, F (1) = 0.12, p =0.74. Additionally, an independent sample t-test revealed no statistically

significant difference in the mean scores on the working memory measure for white (M =10.36, SD = 4.2) and ethnic minority participants [(M = 10.73, SD = 3.88, t (145) = -0.54, $p > 0.05$)] Levene's test for Equality of Variances indicated equal variances (F = 0.20, p = 0.65). There was also no statistically significant difference on the social support measure for white and ethnic minority students [(M = 39.1, SD= 5.1, t(145) = 1.65, $p > 0.05$)] Levene's Test for Equality of Variances indicated equal variances (F = 1.76 and p = 0.19).

After adjusting for social support scores, there was no main effect of stereotype threat on total working memory scores, F (1, 142) = 1.30, p = 0.26, partial eta squared = 0.01. There was also no main effect of race on total working memory scores, F (1, 142) = 0.51, p = 0.48, partial eta squared = 0. Lastly, the race and stereotype threat interaction did not reveal a significant effect on working memory, F (1, 142) = 0.12, p = 0.74. The results of the ANOVA are presented in Table 3. The covariate of social support, however, was significant, p = 0.02, but only explained 3.9% of the variance in the dependent variable, partial eta squared = 0.04. Because our results yielded a significant interaction between social support and working memory scores, we ran a Pearson r correlation that revealed a statistically significant positive correlation (r = 0.19, p = 0.02). Thus, this positive correlation indicates that higher levels of social support among our participants correlated with higher scores on the working memory test.

Table 2 *ANOVA results for the effects of race and social support on working memory capacity of white and ethnic minorities. The ANOVA revealed a non-significant interaction between stereotype threat exposure and race on working memory ability (n = 147).*

Source	***df***	***SS***	***MS***	***F***
Intercept	1	16203.98	16103.98	972.51
Race	1	2.33	2.33	0.14
Social Support	1	25.25	25.25	1.53
Race * Social Support	1	1.81	1.81	0.109

a. R Squared = 0.45 (Adjusted R Squared = 0.2)

Table 3 *ANCOVA results for social support, race, and working memory interaction. *Results show a significant interaction between social support and working memory (n=147).*

Source	*df*	*SS*	*MS*	*F*
Intercept	1	112.10	112.10	6.99
Social Support Total	1	93.13	5.81	5.81*
Stereotype Threat	1	20.87	20.87	1.30
Race	1	8.12	8.12	0.51
Stereotype Threat * Race	1	1.81	1.81	0.12

* Significant at $p < 0.05$

Discussion

Our first hypothesis was that ethnic minority students in the stereotype threat condition would do poorer on the working memory test than white students in the stereotype threat condition. In addition, we expected no significant difference in the working memory scores among ethnic minority and white students in the stereotype threat condition when high levels of social support were indicated. While the first hypothesis of the study was not found to be significant, we found a significant correlation between the social support scores and working memory scores of participants (the second hypothesis).

An ANOVA revealed that the race and stereotype threat interaction did not significantly affect working memory capacity. Our ANCOVA revealed that after adjusting for social support scores, there was no main effect of stereotype threat on working memory scores among ethnic minority and white students. These findings are not congruent with prior research that demonstrates the negative effects of stereotype threat on cognitive tasks. Limitations of our study include our small sample size (n=147) and the low strength of our stereotype threat manipulation. Therefore, the non-significant interaction between stereotype threat exposure and working memory capacity could be due to the low strength and salience of our stereotype threat manipulation. Stereotype threat's strength is increased when the stereotype is relevant in the environment (Aronson, Fried, & Good, 2002). Aronson, Fried, & Good (2002) found that when students are encouraged to view intelligence as malleable rather than fixed, they obtained higher grade point averages than their counterparts in two control groups.

Seattle University's consistent efforts to advocate for racial equity among its student body, through support groups for ethnic minority students and visible representation

throughout the campus, could have moderated the stereotype threat and race interaction. Thus, given the diverse demographics and inclusive culture of Seattle University, stereotype threat may not pose an immediate risk to the ethnic minority students surveyed. In addition to the Seattle University campus, the Pacific Northwest is also a politically liberal region that has advocated for minority populations in social and political contexts. In a region that may be more conservative, less accepting of ethnic minorities, or more prone to the perpetuation of stereotypes, the threat may be exacerbated.

Furthermore, because our results yielded a significant interaction between social support and working memory scores, as well as a significant correlation ($r = 0.19$, $p = 0.02$), we conclude that there are potential cognitive benefits implied with higher levels of social support among students regardless of race. In addition, Dennis, Phinney, and Chauteco (2005) found a stronger significant correlation, $r = 0.35$, between social support and academic achievement. These results may indicate that the social support resources available on the Seattle University campus, such as our Counseling and Psychological Services and clubs run for students identifying as specific ethnic minorities, are beneficial to the cognitive ability of the students.

While stereotype threat poses a unique risk to ethnic minorities, other groups are also subject to these effects. Further research could explore these other groups. Stereotypes about gender continue to hinder women's ability to succeed in male-dominated fields. In 2015, less than 10% of all US fund managers were women, and women exclusively ran about 2% of the industry's assets (Lutton & Davis, 2015). Prior research has investigated these disparities and demonstrated that the extent to which women, who hold positions in the sector of finance, experience stereotype threat in their work environment, they report diminished well-being at work and are less likely to recommend their field to other women (Hippel, Sekaquaptewa, & McFarlane, 2015).

Furthermore, stereotype threat may not require a history of stigmatization (Stone, 2002; Aronson, Lustina, Good, & Keough, 1998). Aronson, Lustina, Good, & Keough (1998) found that stereotypes can be induced by invoking comparisons between math-proficient white males and Asians—a group stereotyped to excel at math. In their experiment, Aronson, Lustina, Good, & Keough (1998) explicitly confronted white males who were taking a standardized math test with the stereotype that Asians outperform white people in math. After controlling for a non-stereotype threat condition, they found white males in the stereotype threat condition got fewer problems correct. Thus, belonging to a minority group may not be necessary, but merely a sufficient factor in academic underperformance. However, it is important to recognize the difference in effect of such a stereotype threat. While minorities are directly targeted at stereotypes of intellectual inferiority—"women are not as good at math as men," "African American students are less intelligent than white students"—the white males in the study are affected indirectly. Their stereotype refers to them by means of comparison to

a directly stereotyped target—Asian Americans. This is congruent with Western cultural norms that imply that white males are the "norm from which direct stereotype targets are viewed as deviating" (Aronson, Lustina, Good, & Keough, 1998) (Miller, Taylor, & Buck, 1991).

Research should continue to focus on the nuances of stereotype threat's effect on cognitive processes. Incorporating a situationist view of stereotype threat can offer an encouraging perspective because it positions the phenomenon within social circumstances. Therefore, altering the circumstances that give rise to stereotype threat may have positive effects on performance. Future research should investigate how the sociopolitical culture of a region or the prevalence of racial tensions and stereotypes may impact stereotype threat and race interaction on working memory. There should also be a continued effort to examine social support's effects on cognitive tasks. On college campuses where stereotype threat may be more salient, increasing social support resources may benefit the academic achievement of ethnic minority students. In an effort to provide an academic setting where all students can perform to their full potential—without the cognitive and emotional deficits stereotype threat elicits—further understanding on how to moderate stereotype threat's effects are worthwhile and necessary.

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Sub-lethal Effects of Heavy Metal Pollution on Intertidal Crustaceans in the Duwamish Waterway

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Introduction

The Green River starts in the Wenatchee National Forest on the eastern slopes of the Cascade Mountain Range. It twists and turns through central Washington and as it approaches the city of Seattle, its name changes to the Duwamish Waterway. Indigenous groups have inhabited areas along the Duwamish Waterway for as many as 12,000 years, making it a cultural, spiritual, and economically significant area (Burke Museum, 2009).

Shortly after white settler colonizers arrived in the West in 1851, the Klondike gold boom in Canada caused Seattle to become a center of industrialization and development (Burke Museum, 2009). By 1920, 4.5 miles of the mouth of the river had been dredged 50 feet deep to straighten its mouth in order to allow for large ship navigation and industrial development (Wilma 2001). Dredging and development of the waterway led to extreme industrial pollution. Industrial toxins include, but are not limited to, elemental toxins (cadmium, zinc, copper, and lead) and toxic organic compounds like polychlorinated biphenyl (PCB), polycyclic hydrocarbons (PAH), and phthalates (Lower Duwamish Waterway Site History, 2017). In 2001 the Environmental Protection Agency (EPA) declared the Duwamish Waterway a Superfund site, an area that has been declared a risk to human and/or environmental health due to contamination, and that receives federal funds for cleanup (Lower Duwamish Waterway Site History, 2017). As Seattle continues to be one of the fastest growing cities in the United States, the resulting pollution from this growth will impact the surrounding ecosystems and the organisms that inhabit them.

Throughout its history there has been specific recording of the heavy industrial pollution along the Duwamish Waterway. According to a 1945 state report there was a recorded 500 pounds per day of acetylene generator waste from Todd Dry Docks and other sources, 200–250 pounds per day of "highly toxic chromic acid solution" from Boeing Plants 1 and 2, and 1,200–1,500 gallons of acid dip dumped monthly from National Steel Construction (Lacitis, 2014). The Washington Department of Ecology lists the currently operating industry along the Duwamish Waterway as cargo handling and storage, marine construction, boat manufacturing, marina operations, concrete manufacturing, paper and metals fabrication, food processing, and airplane parts manufacturing (Lower Duwamish Waterway Site History, 2017).

Industrial and urban activity like dredging, toxic runoff, and dumping of wastewater can have a damaging effect on marine organisms when the deposited contaminants accumulate in sediment. While some metals, like zinc, copper, and manganese, which are naturally present in aquatic environments, are required for the physiological processes of organisms, the majority of heavy metals can cause extreme toxicity and harm to the biological processes of organisms. Heavy metals accumulate in sediments, algae, and the tissues of organisms and are not flushed out of systems efficiently (Frisch, 2011). Crabs are in direct contact with pollutants since they live in, and feed on prey living in, contaminated sediment

(Zhao et al., 2012). It has been found that decapods could not regulate non-essential heavy metals on any bodily level (Rainbow, 1985). Lead was found to be associated with toxicity and retention in benthic organisms over time (Ringenary et al., 2006), and such contamination has lethal or sub-lethal effects on crustaceans. Lethal effects result in the quick mortality of an organism before it is able to reproduce, while sub-lethal effects change the performance of an organism but do not completely hinder its ability to reproduce (Ross, 2002). Examples of sub-lethal effects are reduced fecundity, reduced ability to find food, or reduced biological functions. Heavy metal contamination of estuaries could cause additional stresses on aquatic organisms, which may exhibit changes in respiratory processes, and thus the ability to carry out physiological processes.

Like lead, other toxins can have long residence times and cause sub-lethal effects on organisms. For instance, increased naphthalene, a polycyclic aromatic hydrocarbon and a byproduct of coal refinement, when introduced to crabs caused an increase in oxygen consumption, an indicator of increased stress (Vijayavel et al., 2006). Crabs were observed to have the highest concentration of heavy metals in the lungs (Zhao, 2012). Marine species subjected to heavy metals and toxins similar to those of the Duwamish Waterway are likely affected by such contaminants.

Despite the well-documented history of lead contamination in the Duwamish Waterway, the effect of such contamination on the aquatic organisms has scarcely been studied. Investigation of the aquatic system's ability to recover naturally from a stressor has been neglected considerably in environmental assessments. This dearth of research is primarily due to lack of attention to the recovery from a stressor of an aquatic system and lack of pre-disturbance data to properly assess if a system has recovered (Neimi et al., 1990). Using organisms as monitors would allow for examination of recovery from a stressor, such as sediment contamination.

Studying organisms as pollutant monitors has many advantages over the chemical analysis of abiotic comportments (Karadede-Akin et al., 2007). It has been seen in mussels, oysters, and clams that sediment contamination has effects ranging from changes in the community structure to life history alterations, such as impairment of reproduction and age selective toxicity. In the Puget Sound, sediment was assayed with regards to the life cycle of a marine polychaete worm. Exposure to contaminated sediment resulted in slower growth rates, non-egg bearing females (indicating impaired reproduction), and higher initial mortality rates. Similarly, the impairment of reproduction and development was seen in oyster larvae with sediment contamination (Karadede-Akin et al., 2007).

Examining sediment contamination in the benthos can be separated into two parts: the impacts of sediment contaminants on the benthos and the process by which benthic invertebrates can affect contaminant movement. Organisms can ingest copious amounts of

lead and survive, yet the physiological toll and cycling of these contaminants to the next generation in the ecosystem is largely unknown. The most obvious effect of contaminated sediment of marine invertebrates is direct acute toxicity. More subtle chronic impacts may be observed, such as changes to physiological processes, brooding, and feeding. (Reynoldson, 1987).

The aim of this study was to investigate the impacts of sediment contaminants on commonly found benthic organisms along the Seattle, Washington coastline. We examined lethal and sub-lethal effects of lead contamination on three benthic crustaceans (*Idotea wosnesenskii, Gnorimosphaeroma oregonensis, and Hemigrapsus oregonensis*) along two sites in the Duwamish Waterway in comparison to two other less contaminated sites. We also examined brooding proportions of *H. oregonensis* during the regular brooding season at contaminated and non-contaminated sites. There is significant research on decapods, but we added isopods because they were another species found consistently throughout our contaminated and non-contaminated sites. We also examined *Fucus,* an intertidal algae, because, like our crabs and isopods, it was consistently found and serves as a food source for both species. Examining the effect of sediment contamination on *Fucus* would serve to investigate food source preferences among isopods.

First, we used field surveys to investigate preliminary heavy metal levels in sediment and *Fucus* at the four sites, and to examine the proportion of brooding female crabs, *H. oregonensis,* at the sites. Next, we examined survival of the isopod *G. oregonensis* in contaminated vs. uncontaminated sediments. Finally, we tested whether the herbivorous isopod *I. wosnesenskii* preferred contaminated vs. uncontaminated algae (*Fucus* sp.) for a food source. The purpose of these examinations were to see to what effect, if any, heavy metal contamination in the sediment of the Duwamish Waterway had on the most common benthic-dwelling organisms as an indicator of how the ecosystem has been changed due to repeated industrial pollution.

Methods

Study Area and Focal Species

Contaminated sites included two locations along the Duwamish Waterway, close to the entrance to the Puget Sound. Herring's House is a 15.5-acre area currently under restoration efforts to remediate the Duwamish Waterway as part of the Superfund cleanup effort (Herring's House Park, 2017). Diagonal Marsh is a 1.2-acre park located across the river from Herring's House that has experienced dredging and runoff pollution (Terminal 108 Park, 2017). Both sites consist of a mixture of silty and muddy substrate with small rocks and boulders littered with large amounts of organic debris and human trash. These sites have exposure to freshwater from the Duwamish River, making their water brackish.

The two uncontaminated sites were Golden Gardens in North Seattle and Alki Beach in West Seattle, two beaches associated with public parks. Golden Gardens and Alki Beach differ mostly in substrate, with Golden Gardens providing a fine grain sand beach and Alki Beach providing a rocky pebble beach. Both beaches have constant human disturbance but no industrial activity or presence. Neither beach has any significant exposure to freshwater.

We examined three benthic crustacean species. *H. oregonensis,* known as the shore crab, is a common crab that feeds mostly on diatoms and algae. *Idotea wosnesenskii* is an isopod species that resides on the underside of rocks and eats the intertidal algae *Fucus* sp. (*Pentidotea wosnesenskii,* 2017). *Gnorimosphaeroma oregonensis,* commonly known as the Oregon pill bug, is an intertidal isopod found under rocks that feeds on detritus *(*Light and Carlton 2007).

Heavy Metal Assay

Heavy metal levels were measured in dried sediment (n = 4 per site) and *Fucus* samples (n = 3 per site) from each of the four sites. Sediment and *Fucus* samples were dried at 120 °C for 24 hours then ground into a fine powder in either a mortar and pestle or an electric coffee grinder. A trace metal analysis using an ICP-MS trace metal analyzer was conducted to test for differences in concentration (parts per billion, ppb) of copper and lead. We conducted a one-way analysis of variance (ANOVA) to test whether heavy metal accumulation in sediments or algae differed among sites.

Seasonal Brooding Proportions

To examine whether heavy metal contamination affected the reproductive potential of crabs (*H. oregonensis),* we surveyed the proportion of brooding females from our four locations over late spring to midsummer (May-August). At each site we collected and sexed the crab from under randomly chosen rocks and noted the number of ovigerous (brooding eggs) and non-ovigerous females from a sample of 60 total crabs at each site. We used Chi-Square tests to measure any significant variation of proportions within a given month. If the Chi-Square test came up significant ($P \geq 0.05$), all sites were compared individually using 2x2 Fisher's exact tests to determine which sites were significantly different from each other. We then corrected for repeating measures using a Bonferroni corrected P-value of 0.0083.

28-day Mortality Bioassay

We used a 28-day mortality bioassay to assess the lethal effects of lead levels in sediment from contaminated sites on the mortality of the isopod *G. oregonensis.* A 28-day bioassay is the standard measurement to assess chronic effects of a contaminant in a bioassay (Ringenary et al., 2007). In two-inch glass petri dishes, 5 mL of sediment was added to the bottom with salt water (35 ppt Instant Ocean) filled 1 cm from the top. We obtained lead-

contaminated sediment from the Herring's House site (mean lead concentration = 21.62 ppb) and uncontaminated sediment from Padilla Bay (lead = 1.18 ppb), an additional site that lacked isopods and crabs but did have sediment of a similar size to that of Herring's House. We used two isopod populations, Golden Gardens (uncontaminated) and Herring's House (contaminated), resulting in a 2x2 experiment (isopod population x sediment type). We filled 20 dishes with contaminated sediment, 10 received an isopod from a contaminated site and 10 received an isopod from an uncontaminated site. We prepared 20 more dishes the same way, but filled them with uncontaminated rather than contaminated sediment. One isopod was added to each dish. We used a 2x2 contingency test to examine whether there were any effects on isopod population or lead contamination level on isopod survival.

Fucus Preference

We tested the food preference of two populations of *I. wosnesenskii* for contaminated vs. uncontaminated *Fucus* using a 4-hour habitat choice assay. Isopods were collected from Whidbey Island (uncontaminated site) and Diagonal Marsh (contaminated site). An isopod was placed into a container with contaminated *Fucus* at one end and uncontaminated *Fucus* at the other, separated by 10 cm. At 30-min intervals, we scored if the isopods were on the contaminated algae (score = -1) or uncontaminated algae (score = 1) for a total of 4 hours (n = 8 observations). We then averaged together the score of each individual isopod and conducted a non-parametric Wilcoxon test to see whether there were differences between populations in their preference. Since there were no differences between isopod populations in their mean preference (Wilcoxon test, $P = 0.4359$), we pooled together populations. We then tested whether mean preference values differed from 0 (the null expectation if preference for uncontaminated and contaminated sediment was equal) using a one-sample t-test.

Results

Heavy Metal Assay

There were significantly higher levels of lead (Figure 1a) and copper (Figure 1b) in the Herring's House sediment compared to all other sites ($P < 0.05$, Tukey post-hoc tests). Diagonal Marsh had intermediate lead levels, but was not significantly different from Alki or Golden Gardens ($P > 0.05$). There were significantly higher concentrations of lead in *Fucus* from Herring's House than from Alki and Golden Gardens ($P < 0.0053$). Diagonal Marsh had intermediate lead levels (Figure 1c), but not significantly different from Herring's House, Alki, or Golden Gardens ($P > 0.05$).

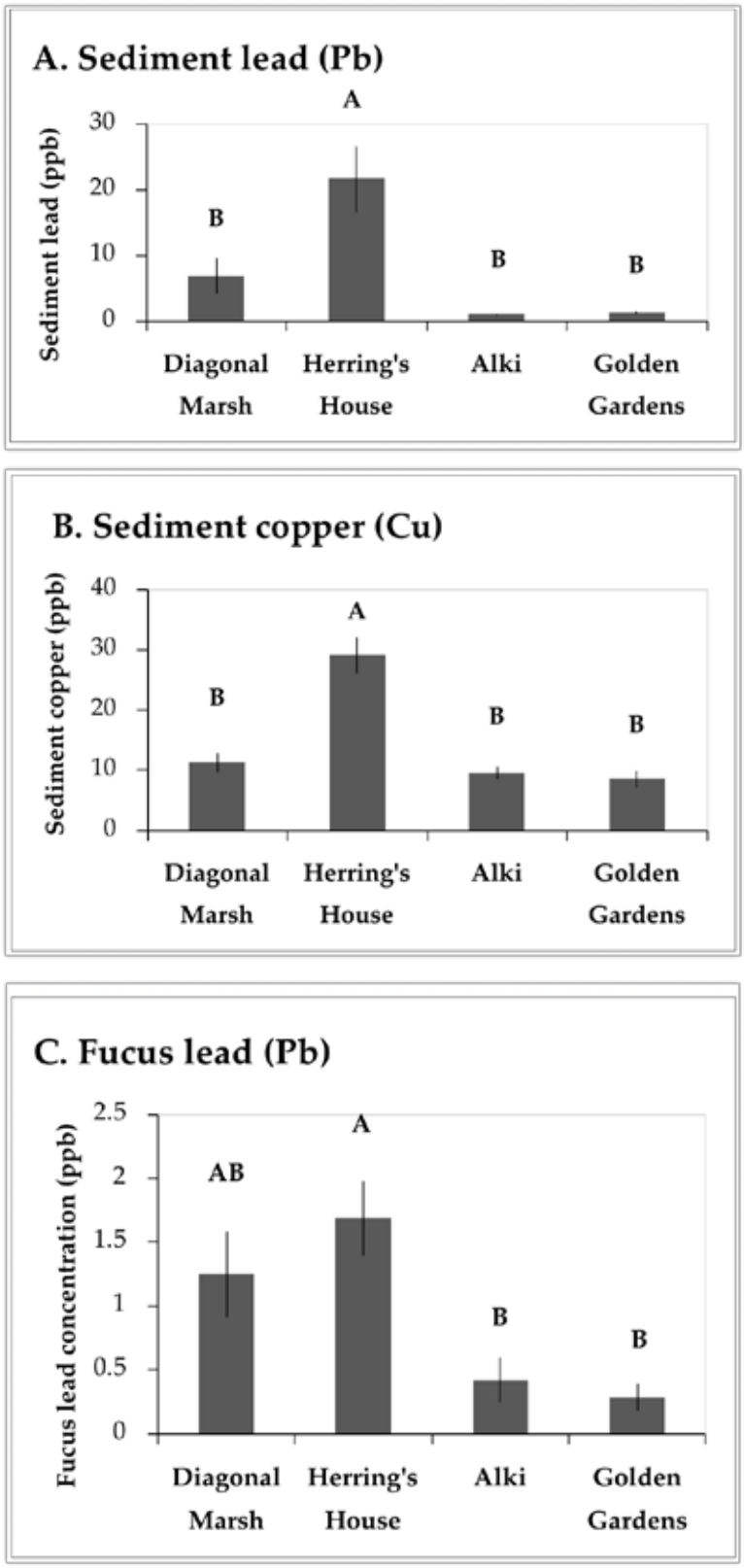

Figure 1 *Average concentrations (ppb) of (a) lead sediment, (b) copper sediment, and (c) lead in Fucus at each of the four study sites: Diagonal Marsh, Herring's House, Alki Beach and Golden Gardens. Different letters over each mean indicate statistically significant differences (Tukey Test). Each sample was collected between May and June of 2017.*

Brooding Proportions

The significant variation in brooding proportions was seen in the months of May and June, with June having the largest proportion of brooding females (Figure 2). In May, Alki Beach was measured having the largest proportion of brooding females and was significantly different from all other sites ($P < 0.0083$).

In June, Alki Beach and Golden Gardens had the highest proportions (40%-60%) of brooding females, though after statistical analysis, only Alki Beach had brooding proportions significantly different from a contaminated site. The brooding proportions at Alki Beach were significantly higher than Diagonal Marsh ($P = 0.0023$). Golden Gardens did not significantly differ from any of the other sites in terms of number of brooding females, possibly because the sample size was low (n=7 female crabs examined). There were no significant differences among sites in August ($P > 0.0083$). In May, only Alki differed significantly from other sites ($P < 0.0083$).

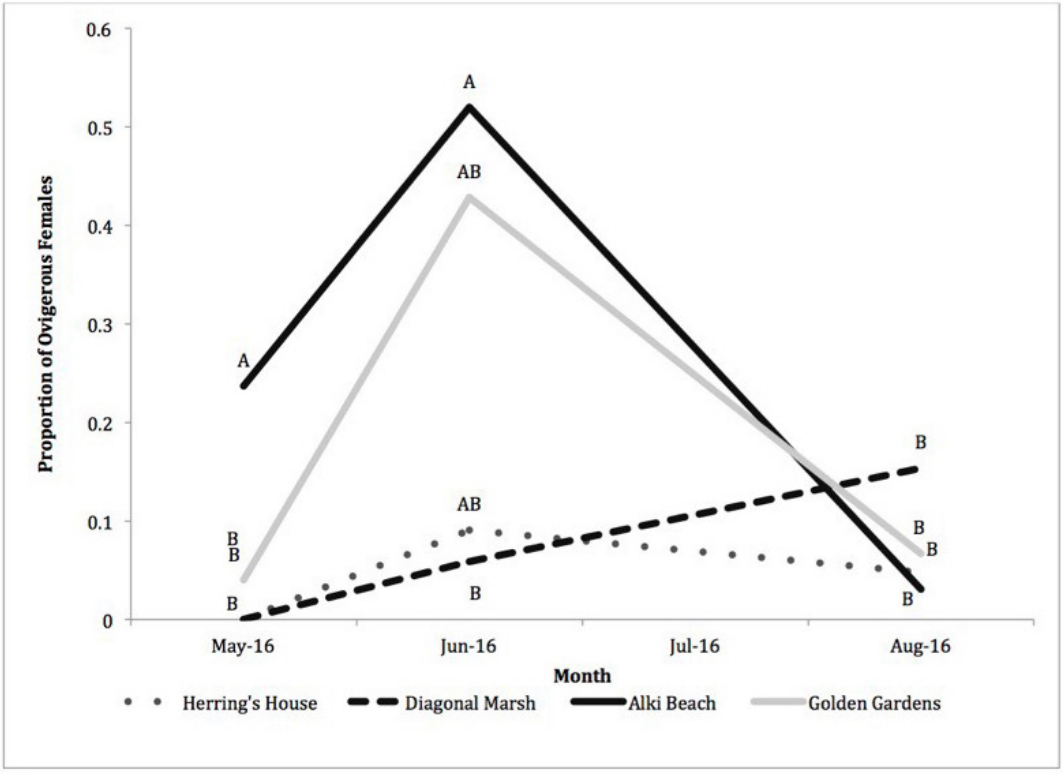

Figure 2 *The proportion of ovigerous females crabs (H. Oregonensis) during the seasonal brooding months (May to August) at each of the four study sites. Different letters by each site indicate significant differences among sites for a sampling date.*

28-day Bioassay

There were no significant differences among treatments in days of survival of *Gnorimosphaeroma* (ANOVA, P = 0.2085, Figure 3). There did appear to be high rates of fatality in juvenile isopods in contaminated sediment in our experiments, but officially recorded bioassays were never conducted, only informal tests. Juveniles were so sensitive to isolated conditions that they rarely made it past 24 hours in test conditions.

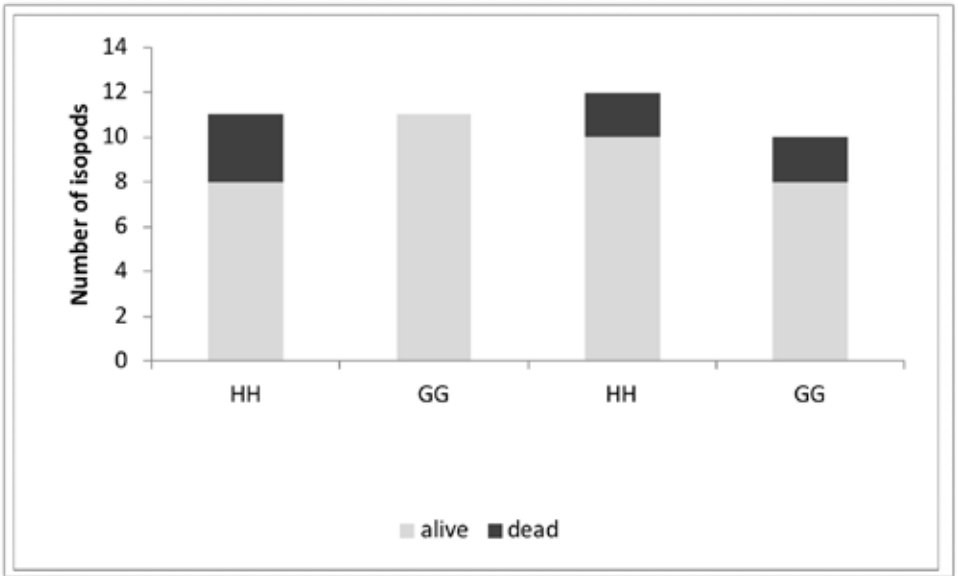

Figure 3 *Mean survival in Gnorimosphaeroma in contaminated and uncontaminated sediments, and from different isopod populations (GG = Golden Gardens, uncontaminated; HH = Herring's House, contaminated).*

Fucus Preference

I. wonsnesenskii isopod populations did not differ in their preference for contaminated or uncontaminated *Fucus* (T-Test, P = 0.3696, Figure 4). Isopods from contaminated sites appeared to have a stronger preference for contaminated *Fucus*, but after statistical analysis they did not differ significantly from the preferences of the isopods collected at the uncontaminated site.

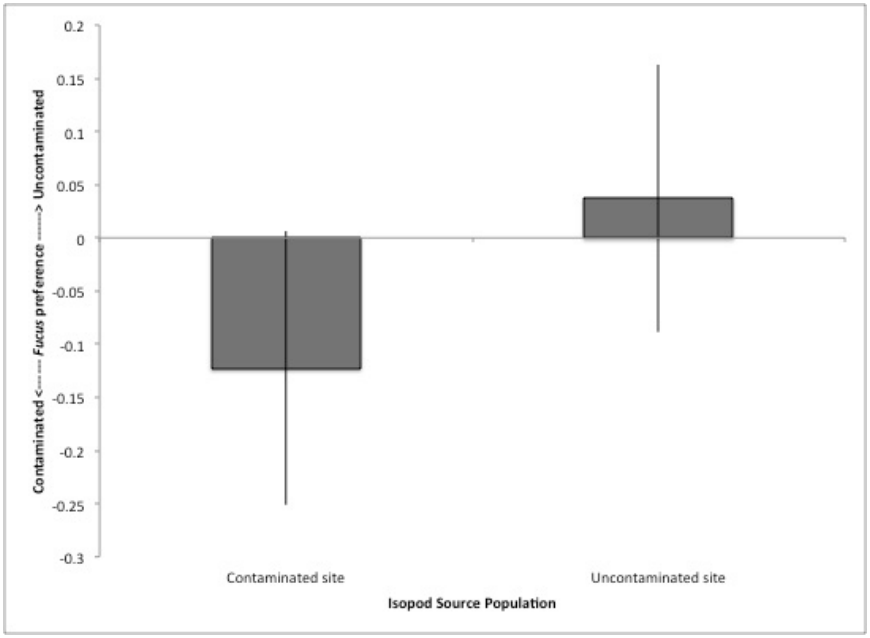

Figure 4 *I. wosnesenskii did not exhibit any significant preferences for either uncontaminated or contaminated Fucus.*

Discussion

The metal assay detected significant lead concentrations among sites in the Seattle area with significantly higher concentrations in both sediment and *Fucus* at sites in the Duwamish Waterway, especially Herring's House. At these same sites, we measured differences in brooding proportions, a sub-lethal effect that has the potential to significantly alter the health of an ecosystem.

The data analysis from our studies points to few measurable effects of heavy metal contamination among populations of *I. wosnesenskii* and *G. oregonensis*. We measured no significant lethal effects among mature populations, and sub-lethal effects remained hard to measure.

Studies involving the juvenile *I. wosnesenskii* were not officially recorded, but they showed high levels of sensitivity in the lab to isolation, regardless of exposure to contaminated sediment. When juveniles were isolated on both sediments, all died within 24 hours. A further study into relative sensitivities and responses to contaminated sediments could improve the resolution of sub-lethal effects on the populations.

Our experiments indicated that contaminated sediment and algae had few measurable, detrimental effects on isopods. Together with the heavy metal assay data and the recorded industrial chemical dumping, our study shows that there is indeed industrial disturbance and pollution. The organisms we studied may be the most resistant within their ecosystems, while other species may have died out long ago. A species presence and absence assay may

reveal species that were once present in these spaces and therefore were more sensitive to local pollutants.

In order to continue this project, a more established understanding of the variation in contamination among sites is key. While these sites have a well-documented history of contamination and disturbance, more heavy metal concentration assays of lead need to be established in order to reinforce the data previously gathered. The levels of the heavy metals in this region may be less than those that significantly affect isopod populations. Since contaminants have been around for 100 years already, future studies might consider incorporating more sensitive species that used to occupy Duwamish Waterway habitats but no longer exist in large numbers there. Incorporating sensitive fish groups such as salmon (*Oncorhynchus sp.*), perch (*Perca*), bass (*Micropterus sp.*), and sole (*Solea*) could benefit future studies.

The differences between brooding females at non-contaminated sites compared to contaminated sites was particularly interesting. Higher proportions of brooding females at non-contaminated sites (significant in the month of June) could suggest disturbance of heavy metal resistance. These crabs may have developed a tolerance to such stressors over years of continuous contaminant exposure, expressing different responses to the disturbances. More often than not, contaminated sites did not significantly differ compared to non-contaminated sites. Disturbances on species in aquatic systems can be classified as pulse and press disturbances, as was done in the study by Neimi et al. (1990). Chemical stressors are examples of pulse disturbances while press disturbances are longer in duration and usually involve changes in a stream channel, where residual stresses may remain for long periods of time (Neimi et al., 1990). It is possible that benthic organisms in the Duwamish Waterway are experiencing pulse and press disturbances, and thus these brooding differences for each month are occurring. Pulse disturbances are considered relatively short-term, discrete events in time; common examples of pulse disturbance are drought and fire. Press disturbances are more gradual and long term, with a cumulative pressure on a system. Scientists often determine classification of a disturbance by considering whether it is short or long term. Runoff from the Duwamish Waterway could be considered a pulse disturbance if it clears from a given parameter in less than a year. However, if runoff remains sedentary within the given parameter, then prolonged contamination could occur and thus be described as a pulse disturbance. Both disturbances occur in the Duwamish Waterway, with locality and severity varying throughout the Waterway, and thus making such disturbances difficult to classify.

In a study published by Neimi et al. (1990), the authors give the example of two aquatic systems, A and B, which experience the same stressor. System A may experience substantial effects from the stressor, while system B experiences minor effects. In contrast, system A recovers relatively fast, while recovery of system B is slow or non-existent. Examining such

systems in a short-term study limits our understanding because by short-term observation the stressor on system A is determined more detrimental. However, in long-term observation we may see that the overall effects are more detrimental to system B because of the slow or nonexistent recovery relative to system A. Continuing a long-term investigation of sediment contamination effect on benthic species in the Duwamish Waterway will be the only vehicle by which the recovery phase of the system can be understood.

It is possible that the benthic organisms studied in this paper were beginning to present an initial example as in system B. Given that these species were still present in highly contaminated sediment, it appears at first glance that crabs, isopods, and *Fucus* are functioning like system B as in the described example. However, only with continuous long-term observation will we be able to clearly see the effects of pollution on such benthic organisms. With the inception of the Superfund project on the Duwamish Waterway, now would be an ideal time to implement continuous observation. Such long-term studies would allow us to see how these benthic organisms change as the Duwamish Waterway is slowly restored. Though we lack knowledge of how these benthic organisms existed prior to heavy sediment contamination, we expect to see changes in benthic species over time through what we hope will be a successful Superfund project. With this in mind, we urge a long-term environmental assessment examining sediment contamination in the Duwamish Waterway to learn how anthropogenic stressors in aquatic environments alter ecosystems for benthic organisms.

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Trends of Migration and Their Effects on Youth in Nicaragua

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Introduction

Migration from Nicaragua has become an increasing trend, dramatically rising in the 1970s due to the Sandinista revolution and continuing to rise because of economic instability (Baumeister et al., 2013). In 2012, about 10% of the Nicaraguan population—roughly 800,000 individuals—consisted of migrants residing outside of the country. Today, this number has remained consistent. As recently as 2017, Nicaragua was the poorest country in Central America and the second poorest in the Western Hemisphere (CIA, 2017). Studies on Nicaraguan migrants concluded that migration out of the country was predominantly driven by economic "push" factors such as structural under- or unemployment and chronic poverty (Yarris, 2014). Nicaraguan migrants are split almost evenly between men and women ranging from age twenty to forty-nine; a large portion of these also identifying as parents (Yarris, 2014). Because these individuals are a major portion of the local work forces, their migration leads to a restructuring of local communities and economies (Baumeister et al., 2013). After a parent migrates, the primary caregivers for children become remaining spouses or other relatives, such as grandparents. While a new primary caregiver may try to fill the role that migrant parents once held, the absence of one or both parents restructures family dynamics and places significant strain on all family members, especially children who require parental guidance and support.

Although many youths feel negatively towards migration, migration as a trend persists. Few studies have been conducted on the effect migration has on family members who stay behind, and the focus in studies that do exist typically centers around migrants and the economic impacts they have on both their home country and country of destination. In this study, I hope to analyze the way migration changes the roles of both grandparents and children, and begin to document the resulting emotional struggles youth experience due to their separation from parents. Ultimately, I hope to reveal the stories and experiences of family members who remain in Nicaragua and demonstrate how they have adapted to cope with the loss of the absent member.

To achieve this, I will first consider migration on a global level and then elaborate on major theories that explain motives for migration as they pertain to this paper. Next, I will expand on the negative side effects experienced by youth due to the absence of one or both parents. Then, I will conduct a more specific examination of migration in Nicaragua and the lasting impacts that have resulted on both a national level and a community level. Finally, I will discuss research methods and design, limitations, intention of research, and stories from the field in order to understand interviews conducted with families of migrants in 2015 and 2016. In concluding this study, I will propose ideas for future research.

Literature Review

Why Do People Migrate?

Researchers have used various theories to explain migration, each of which considers different elements of the situation, such as the economy, the social standing of migrants, and the political climate. For this study, I will apply network theory and New Economics of Labor Migration (NELM) theory to understand Nicaraguan's high rate of outward migration. Network theory argues that a country's continuous pattern of migration systemically shapes the context in which an individual migrates. If individuals who are considering migrating have a preexisting network of family and friends abroad, they are much more likely to decide to move, further perpetuating the flow of migration (De la Garza, 2010). Over time, these networks of migration become embedded in society and, therefore, shift the context in which future decisions to migrate are made. Network theory claims that the existence of these networks cause migration paths to become more defined and subsequently used at higher frequency. This theory argues that policymaking cannot stop emigration or migration because migrant networks become institutionalized after an extended period of time (De la Garza, 2010). NELM theory will also be considered in analysis of this study, particularly as I focus on the role of received remittances. NELM theory became popular in the late 1990s and early 2000s; it claims that families, not individuals, are the deciding factor in migration. NELM theory suggests that remittances, sums of money earned in, and sent home from, countries with more stable economies, are the major causes of increased economic stability within the household and are intended to combat home-country market failures (Haas, 2008; De la Garza, 2010). Furthermore, this theory claims that remittances help families diversify their income streams within a relatively unstable economy, allowing a family to mitigate income disparities within their country. However, if migration, according to NELM theory, is meant to promote economic development for families, this paper aims to add an additional element of consideration: the emotional wellbeing of youths.

NELM and network theory both connect migrants' motives back to a community or family. In the case of Nicaragua and in agreement with network theory, both short-term and long-term migratory networks have become deeply embedded into Nicaraguan society. In consideration of the push and pull factors these networks place on Nicaraguans, this paper will also make suggestions for further research regarding the emotional development of children with migrant parents. In addition, analysis of interviews conducted in Nicaragua in 2015 and 2016 will serve to challenge the reliability of NELM theory, questioning the ways remittances sent home are and are not beneficial, specifically in conjunction with youth development.

Emotional Impacts of Parent-Child Separation

Along with the financial aspects of migration, children's emotional challenges caused by separation are an important factor to consider. In a study conducted internationally on trends of migration, it was found that when fathers migrate, caregiving structures remain mostly intact. However, when mothers migrate, fathers are typically already absent and children are then often left in the care of their grandmothers (Cortés, 2007). When children are transitioned into the care of grandparents or close relatives, the familial caregiving structure is substantively reconfigured (Yarris, 2014). While grandmothers aim to maintain household stability, they are often physically unable to provide in all the ways that a younger parent might have, such as working to earn a regular income or performing physically demanding household tasks. This increases the household responsibilities for youths in migrant families. Despite these extended responsibilities, youths still remain under the authority of both their absent parents and their present grandparents, and this creates competing authority structures within families (De la Garza, 2010).

Ambiguity about who is in charge is frequently coupled with migration's promise of money sent home, leaving children in a state of emotional limbo that can be damaging to their development. Ambiguous loss theory helps provide an explanation for the behavior of children with absent parents. This theory applies to children whose parent's length of absence is undetermined for reasons such as incarceration, military leave, or migration. This theory states that families compensate for the uncertainties caused by temporary absence of family members by creating ways to keep the individual both emotionally and psychologically present while also redistributing their previous responsibilities (Rodriguez & Margolin, 2015). As Rodriguez and Margolin concluded in their evaluation of research on youth development, temporary parental absence has been found to result frequently in strained youth adjustment to new situations and high susceptibility to destructive behaviors in an attempt to receive needed attention (Rodriguez & Margolin 2015). Moreover, the sudden absence of parents can significantly contribute to behavioral problems and stunted emotional development (Pillay & Descoins). When parents migrate, there is often a promised date of return or promise of money to be sent so that children may travel and live with their parent. These promises are likely to change due to the difficult nature of migration and of successfully finding a job in a new country. While there is a promise of higher wages in receiving countries, Nicaraguan migrants lack access to workers' rights and earn lower wages for their work in relation to local economies (Baumeister, 2006). Additionally, while parents are abroad, either long-term or short-term, their absence may produce strained communication among family members, inconsistent parenting practices, negotiation of decision-making power, and reconfiguration of family roles (Rodriguez & Margolin, 2015).

In countries where migration is an integrated part of society, communities tend to be

more emotionally supportive of one another because they identify through shared experience. However, this habituation may also cause youth to underperform academically because they plan to follow their parent(s), thus reinforcing migrant networks that have already been formed (Rodriguez & Margolin, 2015). Youths lacking a parental figure have been identified as requiring greater psychological, social, and material support (Pillay & Descoins, 2006). Despite the positive economic gains from remittances, a parent's migration can lead to psychological and emotional stress, a sense of abandonment, and faltering self-esteem for children and adolescents (De la Garza, 2010).

Study Context: Migration out of Nicaragua

In the 1950s, only around a third of the Nicaraguan population resided in cities, but by the end of the decade, large-scale internal migration began to move Nicaraguans into urban areas such as Managua, León, and Chinandega. This movement resulted in pressure to migrate internationally because jobs became scarce within Nicaraguan urban centers (Baumeister et al., 2013). Following this change in Nicaraguan demographics, studies show three major waves of migration out of Nicaragua (Baumeister et al., 2013). The first occurred during the 1970s due to the dictatorial Somoza regime and the onslaught of fighting between the government and revolutionary Sandinistas. After the Sandinistas successfully overthrew the previous military regime and created a governmental shift to communism, the new government forced those who opposed the revolution out of the country. The second wave began during the 1990s when unemployment hit a new high due to expansive privatization and regulations that were implemented by the new communist government and enforced by the International Monetary Fund. The third wave followed in the early 2000s when unemployment spiked again and a large portion of the population migrated in search of work and higher salaries (Baumeister et al., 2013). In 2005, 65% of households reported at least one unemployed adult; within the employed population, underemployment was documented at 46% (McConnell, 2007). Because of political turmoil, economic hardship, and high unemployment over the years, today it is estimated that around 800,000 Nicaraguans (around 10% of the population) have migrated to destinations such as Spain, Panama, the United States, El Salvador, and most commonly, Costa Rica (Baumeister et al., 2013). In 2016, the World Fact Book specified that roughly 300,000 Nicaraguans are now Costa Rican residents, about 75% of the foreign population (CIA, 2017). Within the three waves of migration, there have been both long-term emigrations and short-term migrations that constitute the annual migrant rates in Nicaragua. Those who migrate from Nicaragua and move further north are considered emigrants because they move with the intention of a long-term residency, indicated by the far distance. Those who move from Nicaragua to neighboring Central American countries are considered migrants because they typically move for a temporary period of time (Thinkmap, 2013). What began with a politically

sparked desire to flee a dictatorial regime has now shifted to a more economically motivated pattern of national and international migration. As network theory suggests, these currents of migration have become normalized in Nicaraguan society. A study published in 2013 identified Nicaragua as a country of transit due to these high rates of migration (Baumeister et al., 2013).

Whether family members temporarily or permanently migrate, there is commonly a promise to send back remittances. These remittances not only support the receiving families, but they have also grown to become a large part of the Nicaraguan economy. As cited by the Nicaraguan Central Bank, during the first trimester of 2016, $302.3 million was sent back to Nicaraguan families, which was about 9.1% of Nicaragua's GDP (Banco Central de Nicaragua, 2016). In 2016, 55.9% of remittances were received from the United States, 21.3% from Costa Rica, 8.0% from Spain, and 6.2% from Panama. The regions of Managua and Chinandega received the largest portions of the remittances: 40.4% was sent to Managua and 11.8% to Chinandega (Baumeister et al., 2013). Drawing from the NELM theorists, we see that remittances counteract the absence of a properly functioning local market and the lack of government programs for familial support, which is often the case in Nicaragua (Sana & Massey, 2005). Depending on family needs, remittances are put towards schooling for children, healthcare, or savings for the future (Cortés, 2007). Remittances can have both negative and positive effects on families, and tension commonly arises when deciding who within the families will receive and manage this money.

Research Design and Methods

The qualitative research for this study was conducted in various neighborhoods in Chinandega, Nicaragua, during June of 2015 and 2016. We chose to perform our research in Chinandega because it has a high annual rate of outward migration. In 2005, the Nicaraguan government estimated that out of all the emigrating Nicaraguans, 26.1% were from Managua (the capitol), 11.5% were from Chinandega, and 10.9% were from León (Baumeister et al., 2013). In 2011, Chinandega had the largest number of migrants to El Salvador and one of the highest rates of migrants to Costa Rica as compared to other departments of Nicaragua (Baumeister et al., 2013).

The interviews that follow are a continuation of prior research conducted by the Universidad Centroamericana (Central American University [UCA]) regarding the effects of migration on Nicaraguan society. Through the Nicaragua Initiative at Seattle University, a small group of Seattle University and UCA students and professors teamed up to conduct semi-structured interviews and collect data. The Nicaraguan non-governmental organization, Servicio Jesuita a Migrantes (Jesuit Services for Migrants [SJM]), was also integral to this research process. SJM is a Nicaraguan organization that works with families in communities

where migration rates are high to provide support and advocacy for Nicaraguan families with members abroad (Servicio Jesuita a Migrants). SJM connected this research group with all interviewees and confirmed consent for the interviews prior to meetings. Their support was vital in helping the interviewed families feel comfortable and have agency over whether or not they wanted to share their stories.

A total of fifty interviews were conducted with youths, parents, and grandparents, who all had at least one family member abroad. School administrators were also interviewed. Interviews were organized by SJM, all with individuals whom the organization previously knew and supported. The conversations were conducted in Spanish with small groups of four to six people, consisting of one or two students from Seattle University and the UCA along with a professor from one of the two universities, the interviewee, and an SJM volunteer. Interviews took place in the homes of the interviewees and were recorded with permission. Each session lasted between one and two hours with one or two follow-up visits typical. In addition to individual interviews, in 2015 this study also held focus groups comprised of four to five Nicaraguan students at the Instituto Público de El Viejo (Public Institute of El Viejo), a public school in Chinandega. All interviews were semi-structured and encouraged those interviewed to expand on their experiences as family members of migrants. Questions included:

1. Who currently resides in the household?
2. Who is currently abroad?
3. How long has the family member in question been abroad?
4. How has their absence affected the family?
5. How do children of migrant parents contribute to household needs?
6. What do youths think about the issue of migration in Nicaragua?

While these questions were the basic prompts, follow-up questions encouraged a more general conversation. Furthermore, the questions we asked depended upon the interviewee, and focus was shifted for grandmothers versus children. In all analysis of interviews, aliases will be used in order to protect the anonymity of those interviewed.

The intention of this collaborative research between UCA and Seattle University was to record oral histories in order to study and draw attention to the complexity of each individual's experiences with migration. Qualitative research methods were intentionally chosen to fill gaps where empirical economic statistics surrounding migration fall short in describing how issues related to migration affect families and communities. Furthermore, research and resulting documentation directly benefited SJM by providing more experience-based information about the community members they serve. By focusing on listening to others, this method of research may act as a form of solidarity when studying difficult social

situations such as migration because the stories of family members of migrants often receive limited attention and this research will generate awareness around the issue.

Results: Stories from Chinandega

Our interviews speak to the long-term effects associated with migration out of Nicaragua and the difficult situations each family faces. It is important to consider the motivation behind why a parent chooses to migrate and the challenges a household endures in their absence. Migration is not commonly a parent's first choice, but many decide to leave Nicaragua because they feel it is their only option for a financially stable future. Clara, a grandmother interviewed in 2015, shared, "Our children leave to try to improve themselves because here there isn't work. How many sacrifices have I made to try to give my children a better life?" ("Clara," June 2015). As De la Garza says, "migration is typically brought about by poor economic conditions, the lack of employment opportunities, poverty, and abysmal living conditions" (2010 p.8). Limited economic resources and job opportunities are the push factors and the promise of high income in destination countries is the pull factor.

With the expectation of a higher income, migrant parents typically have tangible goals they wish to achieve with the money that they earn and send home as "migrants remit funds primarily because they are motivated to support the families they leave behind" (De la Garza, 2010, p.8). These goals may include gaining access to health care and education, or being able to afford improvements on their home. One young man that we interviewed, Joseph (age 19), exemplifies this situation. As the new provider of his household, he shared with us his mother's motivations for migrating:

> Yes, it's that that was her goal, ever since she left, "I am going to finish the house," she said, because look, this part was the house, the part over there in front was the house . . . Look, and there were times when it rained hard and, well, we got wet . . . that was what motivated her to leave and she said "I will finish the house and I will leave," but it continues like this. ("Joseph," June 2016)

At the time of this interview, the main house had a stable roof, but the addition that had previously been started remained only partially finished for many months. In order to earn enough money to finish the house, Joseph's mother left Nicaragua temporarily, leaving his grandmother as the primary caregiver for three years. HIs mother's time in Panama has since been extended because she had difficulty finding a stable job and she recently lost her passport. Joseph explained that his mother decided to leave because a friend in Panama had offered her a job: "Well, for her she was motivated [by] one of her friends from work who invited her…[her friend] gave her a loan and, well, told her about how to get there" ("Joseph,"

June 2016). As explained by network theory, a contact abroad can be a major determinant in a migrant's decision to move. Joseph's story and his mother's motivations for leaving illustrate a broader trend; a parent migrates with the intention of quickly returning, but time apart is often prolonged.

Inconsistent distributions of remittances are a common area of instability in households. With preexisting debts, health needs, etc., "despite the dominating motivation to support children left behind and their caretakers, in actuality only a small portion of received remittances is spent explicitly on children" (De la Garza, 2010, p.10). It is also difficult to ensure that money is regularly sent back to Nicaragua, that it is a sufficient sum of money equal to the family's needs, and that the money is allocated and saved for the most effective impact. Another problem can arise when one or both parents are absent and the role of the financial decision-maker in the family becomes unclear. According to NELM theory, remittances mitigate income disparities, but there are many other factors in the receiving family's household that may complicate the received benefit of remittances. Grandmothers who are caregivers are often unconvinced as to the benefits of remittances. Doña Esperanza was interviewed in 2016 and has cared for sixteen grandchildren and great-grandchildren over the years. Doña Esperanza commented in her interview that she is frequently depicted as the "bad guy" in the eyes of her grandchildren because she has to be the disciplinarian. She disagrees with her son's methods of parenting because she says he only sends his children gifts with the money he earns ("Doña Esperanza," June 2015). Alexander (age 18) interviewed in 2016, also shared that classmates who have had parents abroad for long periods of time eventually take remittances for granted. They spend the money quickly and, in Alexander's opinion, have forgotten where the money is coming from ("Alexander," June 2016). In addition to money not sufficiently filling the absence of a migrant parent, emotional and economic needs of a household remain unfulfilled.

In efforts to compensate for a parent's absence abroad, grandmothers often become the leader and provider of the family remaining in Nicaragua. They are strong figures in Nicaraguan society and frequently serve as one or both parents while also coping with the absence of their own child. "Like other Latin American women of the tercera edad ("third age"), these are women who experience migration simultaneously as mothers whose daughters leave and as grandmothers who assume care for another generation of children back home" (Yarris, 2014, p.2). Alexander shared the following in regards to his own grandmother:

> Thanks to God I have listened to the advice of my grandmother and she has told me "keep studying," and ever since I was in elementary school I have done well and was able to continue to move forward to where I am now. ("Alexander," June 2016)

Unfortunately, despite the emotional strength of grandmothers as the pillar of the restructured family, they are often unable to provide financially for all of their family's needs. In contrast to a common belief that remittances increase familial economic standing, "financial anxieties are often compounded following migration, and grandmothers who assume roles as primary caregivers also assume new burdens as household economic manager" (Yarris, 2014, p.12). In addition to economic responsibilities, grandmothers shoulder emotional responsibilities as they simultaneously work to maintain stable households for youths who have already endured great obstacles in their young lives.

The oldest children are also likely to follow as providers and protectors for families. Alexander went on to share his thoughts about his siblings with us. He lives with only his grandmother and four younger brothers because his father migrated to Mexico when Alexander was only five. It was obvious during the interview that he was proud of his brothers and cared about them.

> Enrieth: And do you watch over your little brothers?
> Alexander: Oh, yes.
> Enrieth: And how is that going?
> Alexander: I go out only with my friends yes, but I watch my brothers to see if they are doing anything bad. It is best that I return and I come home. I give them advice, to not do careless things, carelessness is bad and that's how we move forward. ("Alexander," June 2016)

With the absence of both his mother and father, Alexander has assumed the role of protector of his brothers. Similarly, Joseph commented in his interview: "While [my mother] works hard in Panama, I, well, all of us here from the youngest to the oldest, try to do everything we can, because if we just wait, we won't do anything." ("Joseph," June 2016)

In more extreme cases, migration not only leads to family reconfiguration, but also extended separation. This forces those left in Nicaragua to assume roles as both the protector and the provider with little help. Maria (age 18) acts as both for her two young nephews. She shared:

> One of my sisters got married and lives close and the other had to leave in order to give a better life to her two sons, she promised me that she would go and that she would send me money so I could study but that didn't happen because she also as a really difficult life and now I am the mother of my nephews and it's a very difficult situation. I had to start working when I was 17 and now I have a lot of responsibility. I can't do everything a normal girl my age would do. ("Maria," June 2016)

While parents feel that their only choice is to migrate in order to be successful, children in families feel that their only choice is to pick up slack in familial life.

Continued economic instability is a prevalent pattern flowing through all stories collected for this study. In addition to becoming the protector or caregiver, many adolescent children choose not to attend school in order to work and earn money for their families. Joseph, the young adult previously mentioned, dropped out of school at age sixteen—right before his high school graduation—to begin work at a nearby construction site. He has become the financial provider for his family while his mother continues to search for a new job abroad. Today, Joseph, now 20, has worked several jobs with the hope of returning to school once his mother returns and can help care for their family. The absence of one or both parents frequently causes children to take on adult responsibilities.

Along with parental absence and increased responsibilities within families, youths are also more inclined to act out in a variety of ways. The shift in a child's demeanor can be seen in their school attendance. In 2015, the vice principal of the Instituto Público de El Viejo in Chinandega was interviewed in order to understand the lives of migrant children outside of the household and in a school setting. The vice principal shared that about 30% of her students had one or both parents abroad. The majority of these students were under the care of a grandparent, an aunt, or an uncle. She also noticed in her students with absent parents that poor academic performance, involvement in drugs, and teen pregnancy were much more common. On average, six girls each year become pregnant and leave the school, the majority having one or both parents abroad. With permission of vice principal, interviews were conducted with groups of students between the ages of 10 and 15. Generally, the students understood the economic need for their parents to leave and that working conditions were often better in other countries. Students listed the pros and cons of migration, agreeing that remittances have since provided them with better education and safer housing. They also noted that their parents were earning better salaries abroad. However, despite their understanding of economic realities, most students feared that their parent(s) would forget about their family back in Nicaragua and not return. Furthermore, a few revealed that they intentionally act out at times to get attention. The observations gathered at El Instituto mirror the findings of Rodriguez's 2015 study regarding child-parent separation and correlate to ambiguous loss theory. Because of the uncertainty regarding their parents' return, youth are more likely to respond to new situations with destructive behaviors in order to gain attention (Rodriguez & Margolin, 2015).

In our study, we identified a paradox; while almost all of the adolescents that were interviewed verbalized an economic understanding of why their parents needed to leave, they all shared their determination to remain in Nicaragua when they have children of their

own. In a study conducted in 2002 regarding migrant flows between Nicaragua and Costa Rica, Morales and Castro write, "when a portion of society migrates, with it the society as a whole also migrates; the laborers, their values, their beliefs, their love and their fears" (p.18). Children of migrants today have lived through the difficulty of having a parent absent for most of their lives. They are conscious of the dangers of migration and how a household and society itself can dramatically change. With a parent abroad, financial remittances sent back to Nicaragua do not compensate for the absence of the parent, a crucial figure in a child's life. Regarding his ideas towards migration, Alexander shared with us:

> I, well, I say that the people who migrate, migrate because they are looking for a new life, well, to continue to carry their family forward, but I remember a professor told me that the person who migrates help [sic] their children here, but do not live well because they have a scary realization that where they migrated to is not the same country . . . he said that if we have a family member in another country that we should appreciate them." ("Alexander," June 2016)

As for Joseph, when asked if he ever would leave Chinandega, he firmly responded no. A sister of his grandmother had recently offered him a chance to go and study in Managua, but he decided to stay in Chinandega. He said, "I don't want to . . . but it's that . . . here in Chinandega . . . it's my place. Whatever emergency, I just come to the house, whatever mishap that happens, or if something happens to me, we are all close" ("Joseph," June 2016). Despite the common thread of youth having negative feelings towards migration, in the long run, many eventually choose to leave because of a lack of opportunity.

Limitations of Research

It is important to acknowledge limitations and challenges interviewers faced in this study. Because multiple student-professor groups were interviewing different individuals simultaneously, data recorded and transcribed differs depending on the group's research style. However, data collected was then transcribed and analyzed by a smaller group of researchers in order to maintain some fluidity. Furthermore, interviewers and interviewees had no prior relationship before the meetings, potentially limiting the openness of participants' answers. Interviewers tried to address this issue ahead of time by coordinating with SJM to connect both parties and ensure that those being interviewed were informed and comfortable. While mutual trust took time during the research process, the presence of SJM employees and volunteers helped build bonds between interviewers and participants, revealing new stories and insights over multiple interviews.

Conclusions and Suggestions for Future Research

In Nicaragua, migration has contributed to the shaping of society for decades, but research that considers the family members who remain in Nicaragua after members migrates is limited. Since migration is a common and international trend that is catalyzed for a variety of reasons, it is important to conduct extensive research to understand not only the causes, but also the resulting side effects of such a complex and multifaceted issue. The research conducted in Nicaragua in 2015 and 2016 found that (1) grandmothers play a crucial role in Nicaraguan society as parental figures for children of migrants, (2) youth shoulder numerous familial responsibilities their absent parents once held, and (3) a parent's absence affects youth emotionally. These interviews illustrate a common thread that shows children of migrants taking on roles as providers and protectors for their families, greatly surpassing the typical responsibilities expected for youth of their age. While the intention of migration is to help lift families out of poverty and to provide them with more opportunities, as documented in this research, negative side effects experienced by children challenge the perceived benefits of migration and sent home remittances. After parents migrate, all of those within a household must compensate for their absence. Efforts to reconfigure household roles and dynamics can shake the stability of the home environment and leave youth emotionally vulnerable to harmful decisions. While youth continue to struggle with the absence of parents and feel negatively towards the idea of migrating one day themselves, the lack of job opportunity, systemic poverty, and strong international migrant networks continues to perpetuate migration out of Nicaragua.

While the root problem lies in the systemic poverty in Nicaragua and the lack of a diversified economy, research may be conducted in order to find ways to support children of migrants today. Since Nicaragua arguably experiences social- and community-based harm due to mass migration in search of economic stability, it is important to focus on youth and the next generation so that they may have viable options that allow them to stay in their home country. Confirmed by De la Garza, youth grow up in an atmosphere where their opportunities are defined in terms of emigration rather than opportunities in their home country (2010, p.17). This research conducted in Chinandega, Nicaragua, serves to provide more community-based data collection in order to offer future migration policies with more social groundwork rather than economic and statistical information. Moving forward, any kind of policy solution or support for children of migrants must begin with the experiences, thoughts, and opinions of Nicaragua's youth and those who stay behind to care for them.

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Lamenting the Loss of a Queendom: Resistance in the Legacy of "Aloha 'Oe"

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Aloha Oe	*Farewell to Thee*
Haaheo ka ua inā pali	Proudly swept the rain cloud by the cliff,
Ke nihi aela kanahele	As on it glided through the trees,
E hahai ana ika liko	Still, following with grief the *liko,*
Pua āhihi lehuao uka.	The *'ahihi lehua* of the vale.
Aloha oe, aloha oe	Farewell to you, farewell to thee,
E ke onaona noho ika lipo	Thou charming one who dwells among the bowers
A fond embrace, a hoi ae au	One fond embrace before I now depart
Untill [sic] we meet again.	until we meet again.
Ka halia aloha kai hiki mai	Thus sweet memories come back to me,
Ke hone ae nei i ku'u manawa	bringing fresh remembrances of the past,
O oe nō ka'u aloha	Dearest one, Yes though art mine own,
A loko e hana nei.	From thee, true love shall ne'er depart.
Maopopo kuu ike ika nani	I have seen and watched thy loveliness,
Nā pua rose o Maunawili	Thou sweet rose of Maunawili,
I laila hoohie nā mau u	And 'tis the birds oft' love to dwell,
Mikiala ika nani oia pua.	And sip the honey from thy lips.

Figure 1 *Aloha 'Oe: Hawaiian Lyrics and English Translation*

The song *"Aloha 'Oe,"*[1] depicted in Figure 1, is celebrated throughout the Nation of Hawai'i as a representation of traditional Hawaiian culture. It was written over a century ago by the last reigning monarch of the islands, Queen Lili'uokalani (1838-1917). The song was composed and recorded at a time of political and cultural turmoil in Hawai'i; for this reason, it contains both implicit and explicit messages regarding power structures. Though the song was initially composed in 1878 as a *mele ho'oipoipo* (love song) between a man and a woman, over the years it has been socially, politically, and culturally redefined by *Kanaka Maoli* (Native Hawaiians) into a song of melancholic farewell between the Queen and her realm. Since its composition, *"Aloha 'Oe"* has become one of the most popular and widely recognized Hawaiian songs. Following the overthrow of the Hawaiian monarchy in 1893, as well as the illegal and illegitimate declaration of Hawai'i as the 50th state of the US, the song

skyrocketed in popularity, as evidenced by requests for sheet music and performances (Imada 37). The song's usage has increased since these events with appearances in many mediums, from the film rendition by Tia Carrere in the popular Disney movie, *Lilo and Stitch* (2002), to performances in everyday local events such as graduations, *luaus*, and concerts.[2]

Because of the song's prominence in contemporary culture, it may not be immediately apparent to those listening what the relationship is between *"Aloha 'Oe"* and colonial power, at least when performed by *Kanaka Maoli.* Though initially composed as a love song, the intrinsic meaning of *"Aloha 'Oe"* has been culturally transformed by past and contemporary island musicians into a dirge which laments the loss of a queen, her realm, and the intergenerational effects of these losses. The resignification of *"Aloha 'Oe"* is a reaction against the colonial forces that erased the sovereign rights of Lili'uokalani in Hawai'i. Artists who perform *"Aloha 'Oe"* (and many other songs in the Hawaiian language) resist the attempt to erase indigenous Hawaiian culture. I will use an interdisciplinary constructivist approach to demonstrate that the legacy of *"Aloha 'Oe,"* which resonates today in performance art, represents the continuous resistance of US colonization by championing the sovereignty of Hawai'i.

The purpose of my work is multifaceted: I seek to explore the history of Native Hawaiian protest against colonial US forces and examine present-day resistance against ongoing settler colonialism. I will present this information within the framework of a close analysis of Queen Lili'uokalani's composition, *"Aloha 'Oe*." Though resistance in this piece is demonstrated in multiple ways, I will be focusing specifically on Queen Lili'uokalani's evocation of both the English and Hawaiian languages in the song. In discussing language I challenge the "myth of passivity" in mainstream Hawaiian history; the myth that the *Kanaka Maoli* passively accepted the erosion of their culture and the loss of their nation (Silva 1). This analysis, however, cannot be done without a brief historical exposition of the colonial forces which began to affect Hawai'i in the 1820s and continues to affect the native population today; an analysis of Lili'uokalani's life through her autobiography, *Hawaii's Story by Hawaii's Queen*; and a content analysis of Queen Lili'uokalani's composition *"Aloha 'Oe."*

The most iconic lines of the queen's song are in the chorus: "*Aloha 'Oe, Aloha 'Oe*" which Lili'uokalani herself translated into "Farewell to thee, farewell to thee" (*Hawaii's Story by Hawaii's Queen,* ch. 46). Though nothing more than a combination of beautiful phonemes to the average listener, the colonial context from the perspective of *Kanaka Maoli* and Asian intergenerational settlers[3] shapes the imparted farewell into one from the Queen to her beloved people. My paper historicizes both white and Asian colonialism as both communities have intentionally dispossessed *Kanaka Maoli* of their land, but my paper focuses on US colonialism. This history is crucial to understanding the significance of the queen's song and the perseverance of the oral tradition. However, I would like to recognize that as an Asian American born in Hawai'i, my family has been active and I have been complicit in

the displacement of *Kanaka Maoli*. Our immigration to the islands in the 1980s and 1990s contributed to the ongoing gentrification of the islands. Asian settlers, like my family, have become the majority population on the islands by displacing Native Hawaiians during several waves of migration in the nineteenth and twentieth centuries. The brief historical overview, provided by this paper, of colonization and imperialism in Hawai'i hardly captures the complexity of the atrocities that *Kanaka Maoli* faced and continue to face. In an effort to fight against the whitewashing of Hawai'i's history—which includes, but is not limited to, imposing the English language in all curricula and effacing Hawaiian Natives' struggle for sovereignty—the historical information provided in this paper will be explicitly based on sources written by those with relations to Native Hawaiians or those with Native Hawaiian ancestry.

The first European contact with the sovereign nation of Hawai'i was made in the year 1778, when Captain James Cook embarked with the Royal Navy of Britain upon a voyage to discover a theoretical Northwest Passage, but instead encountered the islands. Immigration of white Europeans and US Americans began immediately after initial contact discovered the economic potential of the islands. Between the 1770s and the 1850s, diseases brought from foreign lands caused a decline in the native population from 300,000 to a mere 60,000 (Cumings 201). By the early nineteenth century, Protestant missionaries and traders began to visit the islands on a regular basis, asserting Christian dominance and exploiting the generosity of the native people.

Hawai'i was undergoing its own internal transformation at the time in regard to the *kapu* (sacred law) system. The *kapu* system was the set of laws and *tabus* which encompassed lifestyle, gender roles, politics, and religion. The *kapu* system divided Hawaiian society into four groups in hierarchical order: the *ali'i* (chiefs), the *kahuna* (priests or skilled craftspeople), the *maka'aina*na (commoners), and *kauwa* (servant cast) (Creager 35). Many of the *kapus*, according to David Malo and other historians, were derived solely from the desires of the ruling king or chief and were a means of maintaining the power of the priesthood (Malo 97). During King Kamehameha's wars to unite the islands in the late eighteenth century, many people began to feel dissatisfaction with the *kapu* because it implied that the common people were subservient to higher authorities. The *kapu* system was upheld in Hawai'i until the death of King Kamehameha I in 1819. Following Kamehameha I's death, King Kamehameha II, his mother Keōpūolani, and another of his father's Queens, Ka'ahumanu,[4] abolished the law by sharing a meal together, an action which broke the law of *kapu's* statement that men were not allowed to dine with women (Kāwika 36). This symbolic act of abolishing the *kapu* system was one of the catalysts of the transition to Christianity in Hawai'i.

Protestant missionaries who arrived in 1820 were at an optimal historical position to take advantage of and "reshape" the systems of Hawaiian society. During this time, missionaries began converting the powerful *ali'i wahine* (women rulers) to Christianity,

specifically Queen Ka'ahumanu and Keōpūolani, who were the two most influential wives of King Kamehameha I. Missionaries, now having invested in high-ranking allies, had the authority to influence the structure of the Hawaiian government, society, and religion (Creager 41). In summation, the missionary's authority allowed whites to infiltrate the local government. Queen Lili'uokalani herself recognized these historical events as deliberate steps taken to overthrow the Hawaiian monarchy:

> Does it make nothing for us that we have always recognized our Christian teachers as worthy of authority in our councils, and repudiated those whose influence or character was vicious or irreligious? That while four-fifths of the population of our Islands was swept out of existence by the vices introduced by foreigners, the ruling class clung to Christian morality, and gave its unvarying support and service to the work of saving and civilizing the masses? Has not this class loyally clung to the brotherly alliance made with the better element of foreign settlers, giving freely of its authority and its substance, its sons and its daughters, to cement and to prosper it? (*Hawaii's Story by Hawaii's Queen*, ch. 57)

These Protestants quickly became the new *kahuna*: spiritual and political advisors to the high chief.

During this time, Protestants made *'Ōlelo* Hawai'i (Hawaiian language) into a written language, translated and distributed the Bible among the masses, and created missionary schools throughout the islands (Creager 41-43). This shift in religion, as well as the introduction of the English language, facilitated the process of internalizing white supremacy, a dangerous change in values that would later lead the US to overthrow the monarchy. By dispossessing *Kanaka Maoli* of their oral tradition and replacing it with a written language, Protestant missionaries eroded one of the most essential factors of shared culture. Therefore, a return to oral performance, such as through *mele*, is an act of resistance against the imposition of written language and, by extension, the colonial overthrow of the Hawaiian monarchy.

Those who came to visit or settle on the islands often expressed their opposition to the Hawaiian monarchy, instead favoring a British-style constitutional monarchy, which limited the power of the monarch ("Hawaiian Monarchy Overthrown," 2012). US powers began establishing plantations to cultivate native crops, exploiting the labor of the Japanese, Chinese, and Filipino immigrants. At the same time, white settlers began to infiltrate the kingdom's government and insidiously force the implementation the Bayonet Constitution. The Bayonet Constitution heavily diminished the power of the monarch—at that time King Kalākaua (1836-1891)—while also eliminating the right of *Kanaka Maoli* and Asian citizens to vote, giving those rights to wealthy white sugar plantation owners instead ("The 1887 Bayonet Constitution,"

2014) . When King Kalākaua died, his sister Lili'uokalani took over as Queen. During her short reign, Queen Lili'uokalani attempted to draft a constitution that would restore the power of the traditional monarchy as well as the voting rights of those previously disenfranchised; however, by this time, many colonizers had infiltrated the local governments and offices, urging more insistently for American annexation and pushing back against the Queen's suggestions ("Hawaiian Monarchy Overthrown," 2012). The tension between the *Kanaka Maoli*'s fight for sovereignty and the colonial population's fight for exploitation of native resources culminated during the 1890s.

In 1896, the Hawaiian language was banned by Sanford B. Dole, the wealthy plantation owner who was a core member of the group that overthrew Queen Lili'uokalani and established the Republic of Hawai'i (Pitzer). The English language forcefully attacked pedagogy at the elementary school level by becoming the medium and basis of instruction in all public and private schools, radically reducing the number of native speakers of Hawaiian. Children who spoke Hawaiian at school, including on the playground, were disciplined in order to discourage them from speaking Hawaiian at home, where most interaction in Hawaiian would be taking place. Moreover, the law stated that if children were to learn a second language, it would be "in addition to the English language," reducing Hawaiian to the status of a foreign language (Pukui). To this day, Hawai'i is the only "state" to have two officially recognized languages: English and Hawaiian. By continuing to embrace the Hawaiian language today, especially in the form of song, as Lili'uokalani did during her incarceration, *Kanaka Maoli* are continuing the long-standing resistance against US assimilation.

Now that the significance of oral performance in the Hawaiian language has been established, understanding the context in which *"Aloha 'Oe"* was produced becomes important, as does its reception and resignification among both the Hawaiian people and their colonizers. Lili'uokalani composed *"Aloha 'Oe"* in either 1877 or 1878, while she was still an heir to the throne. She was already a prolific and established composer at the time, as well as an author and musician. Lili'uokalani initially wrote *"Aloha 'Oe"* as a *mele ho'oipoipo* (love song) after observing a young Hawaiian woman giving her male lover a flower *lei* during their parting at Maunawili Ranch (Imada 35). She was struck with inspiration on the horseback ride back to Honolulu and the story claims that she began humming a tune which would later become the melody of *"Aloha 'Oe."* By the time she reached her personal residence, Washington Place, her riding party had assisted her with the completion of the song. However, this narrative is not the one that is often repeated in Hawaiian reproductions of the story today. The often- repeated, fictitious origin story of *"Aloha 'Oe"* states that the song was written years after Lili'uokalani originally composed the song, while she was on house arrest in the royal palace, as a song of mourning after the US-backed overthrow. This fictitious origin story is why *"Aloha 'Oe"* has become identified as a lament for a lost country and a spirit of

resistance (Imada 36). The disparity between these two stories is resolved by Lili'uokalani's autobiography, in which she states that she transcribed the song again while under house arrest, and it was then published in America:

> Though I was still not allowed to have newspapers or general literature to read, writing-paper and lead-pencils were not denied; and I was thereby able to write music, after drawing for myself the lines of the staff. At first I had no instrument and had to transcribe the notes by voice alone; but I found, not withstanding disadvantages, great consolation in composing, and transcribed a number of songs. Three found their way from my prison to the city of Chicago, where they were printed, among them the "Aloha 'Oe" or "Farewell to Thee," which became a very popular song (*Hawaii's Story by Hawaii's Queen,* ch. 46).

This quote demonstrates that Lili'uokalani transcribed *"Aloha 'Oe"* while under house arrest; however the excerpt does not state that the song was originally composed during her arrest. Both origin stories are valid interpretations of the truth; while the song was initially intended to be a love song, because of its transcription and printing during Lili'uokalani's house arrest, the song is infused with her lamentation. When *"Aloha 'Oe"* is performed today, many people do not realize that it was written by the last queen of Hawai'i: the song's native history is left unacknowledged beneath America's whitewashed versions of history.

Indeed, the whitewashing of *"Aloha 'Oe"* and its narrative perpetuates racial erasure and US imperialism to this day. The first result if you search on Google for the song is a cover by Johnny Cash, whose album *Blue Hawaii* appropriated and profited by Hawaiian *meles*. Therefore, resistance to cultural erasure adds another layer to the complexities of this song when performed by *Kanaka Maoli*. King Kalākaua, known as the "Merrie Monarch" due to his love of music, parties, and fine dining, revitalized the traditional Hawaiian culture of performance art as a resistance strategy. A celebration called the "Merrie Monarch Festival" continues annually across the islands. More importantly, however, he is remembered as the king who brought back a sense of pride to the Hawaiian people. Prior to his reign, many traditional practices were suppressed and banned by Protestant missionary teachings; examples of banned practices include *mele*, dancing *hula*, and *lapa'au* (native healing practices). *Hula* was a form of communication for *'Ōlelo* Hawai'i before written language, expressing shared meanings, histories, religions, and other stories through visual dance and song from one generation to the next. *Hula* has historically been performed in tandem with Hawaiian chants or *meles*; it endures today in part due to King Kalākaua. During his reign, he reestablished and preserved the ancient traditions of public performance (Silva 88). The

Hawaiian *mele* remains a highly evolved form of oral and performative literacy: vital cultural information is commemorated in sung poetry that is in turn visualized through *hula*. Among the many important cultural facets of performance art in general are identity and protest. Thus, the continuation of *mele* performance today is an act of resistance against colonialism and of preservation of indigenous culture.

After Kalākaua's death in 1891, his sister was to rule for only two short years. On January 17, 1893, a group of pro-American forces on the island of O'ahu joined with armed US Marines and marched to 'Iolani Palace with the intent of overthrowing Queen Lili'uokalani in order to establish the "Republic of Hawai'i" as a territory of the US. The insurrection was led by a group of approximately 160 men, most of whom were Americans by birth or heritage. Upon their arrival at the palace, Queen Lili'uokalani peacefully abdicated her throne, though under protest, in order to avoid bloodshed. The queen surrendered Hawai'i's sovereignty to the "superior force of the United States of America." The queen believed that the surrender would be temporary; she was confident that the American government would restore her to the throne:

> We had allowed them virtually to give us a constitution, and control the offices of state. Not without protest, indeed; for the usurpation was unrighteous, and cost us much humiliation and distress. But we did not resist it by force. It had not entered into our hearts to believe that these friends and allies from the United States, even with all their foreign affinities, would ever go so far as to absolutely overthrow our form of government, seize our nation by the throat, and pass it over to an alien power. (*Hawaii's Story by Hawaii's Queen*, ch. 57)

Though President Cleveland did demand that the queen be reinstated to her power, the provisional government that had been established on the islands by Sanford B. Dole and Lorrin Thurston refused. Cleveland attempted to place the matter in the hands of Congress; however, in the end, Congress took no action to restore the monarchy, despite the protests and petitions of thousands of Hawaiian people. One petition was signed by over 21,0000 people, a majority of the native population at the time (Silva 6). Resistance movements filled the following months and years after the overthrow, as *Kanaka Maoli* and other royalists attempted to accumulate and take up arms against the American powers, which consisted of both soldiers and government officials. However, because such stockpiling was considered "treason," Dole's forces captured and imprisoned Queen Lili'uokalani for her alleged role in the coup, along with many of her followers. On January 1, 1896, all royalist prisoners were freed except for Lili'uokalani, who remained under house arrest until late 1896. During this time, she composed many songs and chants in *'Ōlelo* Hawai'i, a native tactic of resistance.

Contemporary renditions of *"Aloha 'Oe"* adhere to the original lyrics written by Lili'uokalani, thus preserving the beauty and spirit of a culture despite all efforts to quash them. Through its resignification by the *Kanaka Maoli* who perform the song, the character roles become transformed from male and female lovers into Hawai'i and the *Kanaka Maoli*—the latter of which must forcefully depart from its love, the *'āina* (land). The first verse of the song describes the beauty of Hawai': *"Haaheo ka ua inā pali/Ke nihi aela kanahele/E hahai ana ika liko/ Pua āhihi lehuao uka*." The first line of the song translates into "proudly swept the rain cloud by the cliff" ("*Aloha Oe*: Farewell to Thee" 2). The first word "proudly" serves to celebrate the *'āina,* but also sets the tone for the remainder of the song. The use of the word "proudly" at the beginning of the song is a subtle demonstration of resistance because the dominant powers on the island wanted to eliminate celebration of the original Hawaiian language, yet Lili'uokalani celebrates it proudly with her first line. Each line provides a description of the natural beauty of the landscape of Hawai'i, from the cliffs of the mountains that form the terrain to the flower buds and trees that inhabit the land. In describing as wild and natural a land that had already been manipulated by Europeans and Americans to create plantations and factories, the song reclaims the Hawaiian scene from its colonial infiltrators.

The significance of embracing nature in *"Aloha 'Oe"* is seen again in last line of the first verse through Lili'uokalani's reference to the *āhihi lehua,* also known as the *'ohia lehua* (*Metrosideros tremuloides*): a shrub that grows near sea level locations and produces bright red flowers. The decision of invoking the imagery of the *āhihi lehua* is symbolic not only because it is endemic to the Hawaiian Islands, but also because of the legend of the flower. In Hawaiian legend, according to Krauss, a man named Ohia fell for a woman named Lehua who reciprocated his love. However, the goddess Pele was also in love with Ohia and, out of anger, turned Ohia into a tree. Lehua, devastated, begged the gods to intervene. Finally, they all compromised and decided to forever unite the two lovers by transforming Lehua into the flower that adorns the *Ohia* tree. The story claims that there is even a relationship between the *lehua* blossom and the rain: when a flower is picked, and therefore separated from the tree, the sky will rain, symbolizing the tears of two lovers who are forced to part. The symbolism of specifically the *āhihi lehua* therefore embodies both the sentiment of longing and separation while also celebrating Hawaiian storytelling (Krauss 77).

Though the chorus' opening line *"Aloha oe, aloha oe"* is the most recognizable part of this song, the entire chorus deserves our attention: it contains clues to a potentially hidden agenda, or even a threat. After the repetition of *"Aloha Oe,"* the lyrics go on, "*E ke onaona noho ika lipo*/A fond embrace *a hoi ae au*/Until [sic] we meet again" ("*Aloha Oe*: Farewell to Thee" 3). Notice that there are two lines in English in the chorus—the only times that English is used in the song. I would argue that Lili'uokalani chose these two lines so that the colonizers would understand them in their own language. The line in between the English phrases,

"a hoi ae au" (here I part), is spoken in Hawaiian, almost as if it is a hushed message to the islands; Lili'uokalani seems to be saying, "I must leave you now, but I will be back to reclaim you." Here we see the Queen's strategy come into play: by making those two specific lines in English, a white auditor might gather that the song is about love rather than resistance. By making the purpose of these two lines ambiguous enough for selective interpretation, Queen Lili'uokalani was able to protect herself from any further repercussions via state-sanctioned violence.

The second verse carries on the sentiments associated with a forced departure, acknowledging that a bitter separation has occurred. The first line begins "sweet memories come back to me/dearest one, yes, you are mine own" ("*Aloha Oe*: Farewell to Thee" 3). These lines demonstrate Queen Lili'uokalani's resistance to colonial powers which continued to claim that Hawaiian land belonged to the US. The final line of this verse states *"a loko e hana nei,"* which translates into the declaration that "from you, true love shall never depart" ("*Aloha Oe*: Farewell to Thee" 3). Adhering to the recast roles of Hawai'i and *Kanaka Maoli* as lovers, this line symbolizes the intrinsic relationship of native people with the land: though "legally" separated, they are one and the same.

There is a theme of melancholy throughout *"Aloha 'Oe"* and the melancholic attachment present in the song is another form of resistance. The yearning for one's lost nation goes beyond mere physical separation and extends into emotional separation. The longing reinforces that the lost object, the realm, is incorporated into one's own being as a state of melancholic attachment, which in this case, is between the indigenous peoples and their land. By drawing attention to how they have been colonized, the *Kanaka Maoli* are also drawing attention to their self-rule, precisely as the US has taken it away.

"Aloha 'Oe," at all stages of its production, publication, and performance, serves as means of resistance against US American imperialism still alive in Hawaiian culture. Renditions of the song as it continues to be covered by local artists in the Hawaiian language, with the simultaneous performance of *hula*, demonstrate the creative and poetic resistance of the *Kanaka Maoli* outside of their historically colonized and prohibited culture.

In the year 1898, the US annexed Hawai'i, but administered the sovereign nation as though it were a US territory until 1959, when it was illegally and illegitimately declared the fiftieth state. By this time, the identified population of native Hawaiians had dropped to 25,000. It was not until 1993 that the US Congress issued an official apology to the people of Hawai'i for the US government's role in the overthrow of the monarch, a role which had not been acknowledged until that moment: "the native Hawaiian people never directly relinquished to the United States their claims to their inherent sovereignty" (Public Law). Though Hawai'i continues to be an ongoing settler colonial site today, as long as *"Aloha 'Oe"* continues to be performed, transcribed, or listened to on iTunes or YouTube, as long as the

song continues to exist, there will be a living rejection of colonial power. Though the chorus is mournful, it does end with the repetition of the line "until we meet again" and this connotes a message of the eventual reuniting of the *Kanaka Maoli* and their land. The reunification can be seen in many organizing efforts to return sovereignty to contemporary Hawai'i. Resistance comes in many forms; it can be seen in the subtle ways that *Kanaka Maoli* reclaim their oral tradition through performance, and in a language that has survived centuries of theft. In this case, resistance did not end when the *Kanaka Maoli* were robbed of their land: it merely transformed into something as seemingly small as the repeated performance of a song.

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Notes

[1] Throughout this paper all Hawaiian words will be italicized, whether they are "naturalized" English words or not. This decision has been made in order to emphasize that simply because a word is in the English dictionary does not mean it belongs to us.

[2] This is a link to a rendition of Aloha 'Oe by prominent Hawaiian performers Israel "Iz" Kamakawiwoole, Henry Kapono, Cyril Pahinui and Roland Cazimero. This performance took place on a Hawaiian homestead as part of a larger television special about the Hawaiian sovereignty movement in the 90s and captures the resilience of the aloha spirit. YouTube link: https://www.youtube.com/watch?v=zXOzNiKceps (Kapono).

[3] While Asians and Asian Americans have contributed to the colonization of Hawai'i and the whitewashing of the Hawaiian culture, intergenerational families tend to adopt some Hawaiian cultural values and begin identifying with Kanaka Maoli. Once people start identifying with Kanaka Maoli, many become allies.

[4] In the Hawaiian monarchy, a King had multiple wives. Keōpūolani was Kamehameha I's "Sacred wife," who gave birth to heirs to the throne. Ka'ahumanu was another one of Kamehameha I's wives, known as the "Favorite Wife." Because all wives were close with the king, they had a fair amount of influence over the decisions the king made and over elections to positions of power.

Dream Recall, Sleep Quality, and Short-Term Memory

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Introduction

Dreams and sleep occupy nearly one-third of people's lives, yet they remain some of the least understood phenomena of the human experience (Buzaki & Watson, 2015). Whereas some people recall almost all of their dreams from the night before, 3% – 7% of people claim to never have dreamed at all (Herlin, Leu-Semenescu, Chaumereuil, & Arnulf, 2015). The current study examines the frequency of dream recall of individuals in relation to short-term memory (STM).

Despite much research dedicated to dreams, scientists still do not know why some remember their dreams and others do not. Several theories attempt to explain why people dream, from Lyon Research Neuroscience Center's (2014) research showing a positive relationship between wakefulness during sleep and dream recall, to WebMD's (2003) report on the relationship between dream recall and creativity. The connection between dream recall and STM is far less studied. Many people recall the content of their dreams upon waking, and forget them later in the day, contributing to the idea that dream recall is related to STM.

When considering research on dream recall, sleep quality and STM, we must first understand how these variables are operationally defined. Sleep quality usually refers to how well an individual sleeps at night, whether this be how rested they feel, the number of times they were disturbed from their sleep, amount of time slept, or how long it took to fall asleep. Dream recall assesses whether an individual can recall the content of their dreams. For the purpose of this study, we define memory as a way for the brain to store and refer back to information. Many different types of memory exist, such as short-term, long-term, working, and explicit memory. Researchers seek to understand the correlation between dreaming and memory in order to uncover the reasons for dream recall ability; however, previous studies found inconsistencies when examining these two variables. Our current study institutes a possible connection between these three specific variables to extend the research in this field.

Literature Review

In the first half of the twentieth century, little research existed on dream recall frequency and dream recall failure. After the discovery of rapid eye movement (REM) sleep in 1953, investigations into the relationship between dreaming and memory led to a swift increase in research regarding its effects (Koulack & Goodenough, 1976). Despite the exponential growth of dream research in the field of psychology, few studies examine the relationship between dream recall and STM. Prior research has also suggested an association between dream recall frequency and memory. A study conducted with groups of individuals who exhibited high recall ability and those who exhibited low recall ability showed that those who exhibited high recall ability performed significantly better than those who exhibited low recall ability on a memory task, indicating a link between dream recall ability and STM (Martinetti, 1983). Researchers have also found a positive relationship between dream recall and ability to recall

early childhood memories (Robbins & Tanck, 1978). This study focused on the act of recalling dreams distinctly from recalling content of dreams, thus focusing ongoing research in the direction of recall ability alone, as opposed to dream content recall ability. However, not all research has indicated a clear connection between dream recall and memory. Indeed, several studies even suggest there may be no relationship. For example, previous studies found no relationship between dream recall frequency and visual memory (Cohen, 1971).

The potential relationship between sleep quality and memory, however, has been well documented by research from the past 50 years. Researchers have found that sleep-deprived students scored significantly worse on a memory-recognition test than non-sleep-deprived students (Elkin & Murray, 1974). A similar study found that self-reported insufficient sleepers performed significantly worse on a memory-span task than those who reported sufficient amounts of sleep (Gradisar, Terrill, Johnston, & Douglas, 2008). LeWine (2015) conducted a longitudinal study over 14 years involving female nurses who were interviewed about their sleep habits, memory, and thinking skills. The study found that those who had less than five hours of sleep or more than nine hours performed significantly worse on cognitive tests. The link found between poor cognitive functioning and low sleep amount was expected, but the link between poor functioning and *too much* sleep was surprising. These studies indicate that there is a potential link between sleep amount or quality and memory, and this warrants further research on their relationship.

Various methodological limitations may explain these differences. Multiple studies in this body of research have relied on self-report data only, raising issues about their validity. Further, this data comes from a small, mostly homogeneous sample, suggesting conclusions drawn may not be representative of all people. For example, a study by Martinetti (1983) not only had an extremely small sample of thirty participants, but also the participants were all women of roughly the same age and education status, and this harmed the generalizability of the findings. Additionally, Robbins and Tanck's research (1978) relied on self-reports to measure long-term memory from the ages of four to six, raising concerns about the accuracy of these early memories and the validity of their memory measure. Given these concerns, it is worthwhile to extend past work on sleep, memory, and dream recall, incorporating certain methodological improvements.

Current Study

To address some of the concerns in previous research, the current study moves away from long-term memory because of the difficulties in practically and accurately recording such memories. Further, we committed to a larger sample with a more diverse demographic makeup, to capture more reliable and generalizable estimates of the relationships among these variables. In addition, we used established, continuous scales that more accurately capture

these measures. By employing more appropriate measures and a larger sample, the present study aimed to replicate and improve upon previous research with dream recall and memory.

Considering a similar study that found a relationship between dream recall and STM (Martinetti, 1983), the current study tested three hypotheses. First, we predicted that we would find a positive relationship between sleep quality and dream recall. Second, we predicted a positive relationship between sleep quality and STM. Lastly, we hypothesized that individuals who display better STM will recall dreams more frequently, even when controlling for sleep quality and age. In short, we expected a positive relationship between sleep quality and STM, dream recall and sleep quality, and dream recall and STM.

Method

Participants

In this study, 229 individuals completed some or all of the measures most relevant to our research questions. Of these, 24 (13%) individuals were excluded from analyses due to failure to complete more than 50% of the survey, making their data unusable for most analyses. The remaining 205 participants (87%) were included in the analyses.

The present sample consists of 44 (21.5%) males, 158 (77.1%) females, and 3 (1.5%) non-binary participants. Participants ranged in age from 18 to 85 years, and on average were 38.55 years old (SD = 16.35). Frequencies of age within our sample are represented in Figure 1. The majority of the sample (78.6%) was White or Caucasian, with smaller subsets of the sample identifying as Asian (6.8%), American Indian or Alaska Native (1.5%), Black or African American (.5%), or multiracial (5.8%). A small percentage (3.9%) identified as a race other than those listed, and the remainder either did not respond (1.9%) or declined to answer (1%). In addition, 9.3% identified as Hispanic, Spanish or Latino/a, with the remaining 88.3% not identifying with those ethnicities, (1.5%) not responding, (0.5%) preferring not to say, or (.5%) not knowing. The majority of the participants included 46% full-time employees, followed by 20% students. Of our sample size, 41% were married and 38% were single. The majority of participants (41%) had some college experience, with 21% of participants holding a Bachelor's Degree.

Procedure

A survey was created on the online survey program, Qualtrics. The online survey was posted on Seattle University's subject pool website, and shared on the authors' personal Facebook pages. On Facebook, a "snowballing" sampling method was implemented, in which those who saw the post were encouraged to share it with their Facebook friends. Participants were required to provide their consent to participate before beginning the survey, and they were thanked after completing the survey. Individuals participating via the university subject

pool were awarded research participation credit in their courses; otherwise, no compensation was provided for participation.

Measures

Demographics: to examine the sample makeup and establish the generalizability of the present study, we assessed the following demographic variables: race, age, gender, education level, employment status, and relationship status. A summary of these statistics is available for reference in the Participants section. We recoded the values for age so that the established value was the same as the actual age, because the minimum age for participation in this study was 18 years old (e.g., changing the value of 1 to a value of 18, 2 to a value of 19, etc.).

Sleep Quality: sleep quality was defined as subjective satisfaction with one's nightly sleep, not including naps (short periods of sleep during the day). We used the PROMIS Sleep Questionnaire to assess for sleep quality (Yu et al., 2011). Questions within this measure included variables like amount of sleep, the number of disturbances to sleep, how long it took the participant to fall asleep, and how rested they felt after waking. These topics were assessed on a five-point scale: beginning with "not at all," then moving to "a little bit," "somewhat," "quite a bit," and finally ending with "very much." These reports were averaged, providing each participant with a single score to represent their sleep quality (M=2.71, SD=.82). These questions were reverse coded (e.g., two responses were recoded in the PROMIS questionnaire so that 1 (very poor sleep) became 7 (very good sleep) and 7 became 1, in order to follow with the instructions of scoring the answers to the survey. We further assessed sleep quality with the following items: questions about amount of sleep on weeknights, weekend nights, and whether or not participants take naps and for how long. However, these additional questions were ultimately not included because they lowered the PROMIS sleep questionnaire's internal consistency (α = .89).

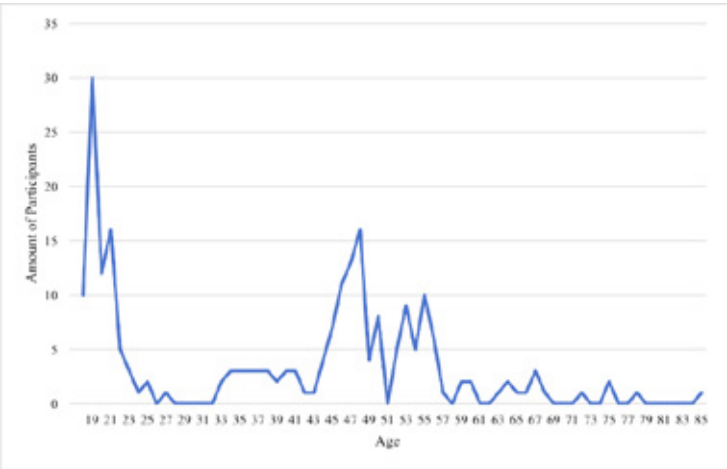

Figure 1 *This line graph represents the prevalence of the ages of the participants involved in this study.*

Dream Recall Frequency: dream recall was defined as the frequency at which a person could recall their dreams within a two-week period. Dream recall was measured with a self-report questionnaire that examined the frequency with which the participant is able to recall their dreams within a two-week timeline ($\alpha = .69$). This eight-item measure accounted for frequency on a seven-point scale—every morning (1), about every morning (2), every other morning (3), about two mornings a week (4), one morning a week (5), once during two weeks (6), and not once (7). For the purpose of running a regression, the answers for this questionnaire were computed for a mean and this mean was given a separate variable to serve as the dream recall frequency score (M=2.49, SD=3.51).

Short-Term Memory: STM is information stored for a temporary amount of time, typically ranging from 15 to 60 seconds. To assess STM, participants were told to try to memorize as much as they can in 30 seconds from a list of 15 words: eggs, flag, drawing, trial, rock, partner, apple, house, focus, life, mission, chair, favor, ice, and brain. Participants were not told that they would be recording the words from memory. After observing the words for 30 seconds, participants were redirected to a page that asked them to list as many of the words as they could remember. In order to run a regression, we had to compute the mean scores for the STM test, therefore adding a separate variable for the measure that was a calculation of the participants' mean. Their performance was calculated as the number of words correctly recalled, with higher scores indicating greater STM.

Results

Hypothesis 1: Dream Recall & Sleep Quality

We conducted a standard regression analysis to observe the relationship between dream recall and sleep quality. The results from these analyses can be referenced in Table 1. Sleep quality accounted for 1.1% of the variance in dream recall, $F(1, 203) = 2.27$, $p = .134$. Sleep quality did not make a significant contribution to the explanation of variance, and there was no relationship detected between sleep quality and dream recall ($\beta = .105$, $p = .134$).

Hypothesis 2: Sleep Quality & STM

We conducted another standard regression analysis to investigate the relationship between sleep quality and STM. Sleep quality accounted for 0.0% of the variance in STM, $F(1, 203) = .006$, $p = .938$. Sleep quality also did not predict with statistical significance STM scores ($\beta = -.005$, $R = .000$, $p = .938$).

Table 1 *Standard Linear Regressions on Sleep Quality, Dream Recall, and STM*

	R^2	R^2 Change	F Change	Beta
Sleep Quality & DR	.011	.011	2.265	.105*
Sleep Quality & STM	.000	.000	.006	-.005**

*p = .134

**p = .938

Hypothesis 3: Dream Recall & STM

We ran a hierarchical regression analysis in order to examine the relationship between dream recall and STM while controlling for sleep quality and age. The results are displayed in Table 2. Sleep quality and age were entered in the first step and they explained 3.3% of the variance in STM, $F(2, 202) = 3.49$, $p = .032$. For the second step of the regression we added dream recall. This did not explain any additional variance (0%), F change (3, 201) = .064, p = .075. The total variance explained by the model as a whole was 3.4%, F (3, 201) = 2.34, $p = .075$. In the final model, dream recall did not predict with statistical significance STM ($\beta = -.018$, $p = .80$). The control variable of age was a statistically significant predictor in STM ($\beta = -.183$, $p = .009$), but sleep quality did not predict with statistical significance STM ($\beta = -.008$, $p = .91$). There were no additional findings beside the variables assessed from the hypotheses.

Table 2 *Hierarchical Multiple Regression on Dream Recall and STM After Controlling for Age and Sleep Quality*

	R^2	R^2 Change	F Change	Beta
Dream Recall	.034	.000	.064	-.018*

*p = .80

Discussion

Our findings indicate that there is no relationship between dream recall and STM. The results also indicate that sleep quality does not predict dream-recall frequency or STM, thus

allowing us to reject all three of our hypotheses. We did, however, find a relationship between age and STM, implying that as a person ages, the quality of their STM decreases. This was not an initial focus of the present study; however, we found it important to recognize our demographic and control for this within our regression. We acknowledge that our findings differ from those of past literature and encourage those who with access to different resources to access these results.

Our first hypothesis—that dream recall is linked to sleep quality—was not supported. This contrasts prior research that an individual's recall ability was impacted by sleep quality (Elkin & Murray, 1974; Gradisar, Terrill, Johnston, & Douglas, 2008). However, many of the results from prior studies were based on an experimental method, which may have influenced the differences between our findings. Moreover, the current study indicates that if people are looking to improve the frequency with which they recall their dreams, they should not be concerned with their quality of sleep at night.

Our second hypothesis—that sleep quality is related to STM—was also not supported by our data. This again opposes prior research, which suggests that sleep quality may have a significant impact on performance of a STM task (Elkin & Murray, 1974; Gradisar, Terrill, Johnston, & Douglas, 2008). The differences in these findings are most likely due to the varying methods in each study, as previous research was often done via a controlled experiment many years prior to the introduction of research on measures for assessing sleep (Elkin & Murray, 1974). The present findings propose that people should not be concerned with their quality of sleep in regard to the testing of their STM. If one is looking to improve STM, they should look elsewhere, to other factors.

Lastly, we found no relationship between dream recall frequency and STM, and therefore must reject our third hypothesis. This implies that an individual's ability to recall their dreams does not predict the quality of STM. This is contrary to the majority of the previous literature that found significant differences in memory scores depending on dream recall frequency (LeWine, 2015; Martinetti, 1983). Our research indicates that dream recall frequency does not predict STM.

There are many potential explanations as to why we found these results, especially as to why they are different from those of previous literature. One of the main reasons is that a majority of previous research connecting dream recall and memory did not look at STM specifically, but other types of memory as well, such as long-term, explicit, or working memory. When formulating our hypotheses, we wanted to extend past research into other types of memory to see if we would find similar results. However, there was little to no past research that evaluated the relationship specifically between dream recall frequency and STM. By introducing the relationship between recall of dreams and short-term recall of words, we were inspecting a specific type of memory being recalled in terms of our contribution to this

area of research. Considering that what we were evaluating varied from that of previous research, it is understandable that our results varied. We also recognize that other factors that we did not account for may have impacted our results. Whether this be academic background, career, or overall intelligence, it is important to examine all factors in order to potentially uncover an unrecognizable similarity or component that may have more impact on a variable than we initially anticipated.

Another way to interpret these results is to accept that dream recall and STM are indeed not related. Although our conclusion is flawed by limitations, it is also possible to conclude that there is no relationship between these variables, especially considering that our research is more methodologically sound than previous research. Great efforts and attention were focused on developing a more rigorous study design than those of previous literature. When replicating similar research questions to past studies, we wanted to assure that our results were applicable to a broader population. To do this, we incorporated a broader sample size, set a wider age range, and did not limit participants to explicit genders or locations. We did do our best to avoid limitations, but limitations still may have impacted our results. Nonetheless, our study is an improvement in terms of diversity of the sample.

Limitations

Our research suffered from several limitations, which provides opportunities for improvement of future research. The measures of our research were limited because we did not have access to a sleep lab, nor did we expect participants to maintain a dream journal. We recognize that with these more objective measures the results would have more accurately captured the measurement of sleep quality and dream recall frequency, and they may have been more applicable to a broader population. Previous research sometimes used these features, which might account for part of the inconsistency between our findings and past work.

Our lack of demographic diversity could also have had an impact on our results. Our sample was primarily women, indicating that our findings may be most applicable to women rather than to men. Further, despite our participant ages ranging from 18 to 85, our survey predominantly collected data from young adults and midlife adults. Another limitation was our inability to find an established dream recall frequency scale that was not also seeking information regarding dream content.

Although our methods were robust against violations of assumptions, it is important to note that the multiple regressions conducted for STM and sleep quality violated the linearity assumption as shown by non-linear points on the normal P-P plot, suggesting deviations of normality. This is also true for the regressions conducted for sleep quality and dream recall. The scatter plot for the standard multiple regression with sleep quality and dream recall also

showed a violation of the normality and homoscedasticity assumptions represented on the plot, thus indicating that the variables could be maintaining the same finite variance.

In terms of future research, we first propose that a similar concept regarding our hypotheses be replicated, but use measures that more accurately capture the constructs for which we sought information by improving on our limitations. In order to validate our findings, we first propose that future research limits the restrictions that the current study was affected by. This body of research promotes the use of experimental studies to distinctively capture a causal relationship. This could come from measuring sleep quality in a sleep lab so as to more accurately capture sleep quality.

Conclusion

The most cogent interpretation of the current research indicates that there is no relationship between dream recall, sleep quality, and STM. Although no relationship was found, these results are still valuable to the research community within this field, particularly because it examined a new approach by testing the relationship between those three variables. This introduces more questions regarding the relationship between these variables, and further research is warrented. Because the results in this study declare inconsistent outcomes in comparison to past literature, they question prior findings and indicate that there are ties between dream recall, sleep quality, and STM. Future research should be conducted that avoids the limitations of our study as well as the other methodological flaws of previous research in order to validate which findings best capture the posed hypotheses and which are more accurately representative of a population.

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Civil Disobedience: What Would Thomas Aquinas Do?

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In April of 1963 from a jail cell in Birmingham, Alabama, Martin Luther King Jr. famously wrote a letter that states, "We who engage in nonviolent direct action are not the creators of tension. We merely bring to the surface the hidden tension that is already alive" (73). King was jailed for leading a demonstration in Birmingham, disregarding a state circuit court-filed injunction against protests. The demonstration itself served as a nonviolent direct action in response to the racial injustice occurring in Birmingham. King wrote that the demonstrators "would present our very bodies as a means of laying our case before the conscience of the local and the national community" (66). In his letter, King sought to respond to those who criticized his methods of fighting racism and oppression; he justifies the use of civil disobedience by citing the words of historical figures, condensing a relevant argument by Thomas Aquinas down to a sentence: "To put it in the terms of St. Thomas Aquinas: An unjust law is a human law that is not rooted in eternal law and natural law" (70). If a reader does not have a background in Aquinas, this sentence might read as philosophically technical and perhaps even as meaningless. However, Aquinas' theory fully justifies King's actions, and provides a strong moral foundation for civil disobedience.

This essay seeks to critically consider the justification for and application of civil disobedience through a Thomistic lens; that is, I will use Thomas Aquinas' work to evaluate whether our modern concept of civil disobedience is justified and when such action is just. It is my intent to identify the set of conditions under which Aquinas would support civil disobedience. Namely, I will posit that Aquinas would support such action under the conditions that the action purposefully adheres to natural law for the sake of a higher morality, and that it is a nonviolent act with a direct relationship to the aspect of the law that is unjust. Ultimately, I will claim that based on Aquinas' established theory of law, an individual is in fact *morally obligated* to engage in civil disobedience. The paper has five parts. In section one I will examine the concept of civil disobedience as described by several contemporary philosophers. These descriptions will provide the foundation for my usage of the term "civil disobedience" as I move forward. In the second section I will present Aquinas' theory of law and give a detailed account of the aspects of his theory that are relevant to my argument for obligatory civil disobedience. In section three I will consider how Aquinas' work aligns with a modern conception of civil disobedience and how it can be seen as historical groundwork for such a concept. How do we know when to enact civil disobedience? This section applies the framework for civil disobedience that I have noted in Aquinas' work to two contemporary examples where there was perceived injustice. In the fourth section I will investigate the aims of modern civil disobedience, such as policy change and pure action. The fifth and final section will consider a real-world argument for obligatory civil disobedience made during the Nuremberg trials, and ultimately conclude whether Aquinas would have supported this argument.

Modern Civil Disobedience

Before we can ask whether Thomas Aquinas would support modern civil disobedience, we must define the act by considering its causes and consequences. What are the most significant aspects of civil disobedience? Two clear positions emerge, one fixating on the initial motivation for the act and the other on the concrete goals of the act. The term "civil disobedience" is also widely and often improperly applied. This is a sticking point in the debate of what actions can be considered civil disobedience: should the term be defined by its common use, or should the term only be used when a situation satisfies a strict definition?

For this reason, I will rely on the near consensus of several philosophers to establish my functional definition of civil disobedience. Political philosopher Rex Martin defines civil disobedience as "the deliberate and public violation of the command of an authorized and accepted political superior on the ground that this decree is unjust, immoral, unconstitutional, contrary to good public policy, etc." (126). Similarly, moral and political philosopher John Rawls defines civil disobedience as "a public, nonviolent, conscientious yet political act, contrary to law usually done with the aim of bringing about a change in the law or policies of the government" (320). These definitions can be used jointly to define civil disobedience as an act that is a deliberate violation of a standard. The deliberate nature of the act seems to be a necessary condition. Lawyer Earl F. Morris excludes one of the most historically famous examples cited as civil disobedience for this reason: he claims that Rosa Parks' refusal to give up her bus seat for a white man is not civil disobedience because she was not actively rejecting moral injustice, but because she was tired and her feet hurt (654). Purposeful action, then, is a necessary element.

Both definitions require that civil disobedience be public because private violation of the law is not always apparent to others and does not truly show moral conviction. Additionally, private violation of the law will likely spur no change. This is the point where the definitions diverge. While Martin posits why one would engage in civil disobedience in the first place, Rawls specifies an end goal to implement policy change. Martin's rationale for civil disobedience is nearly lifted straight from Aquinas: the decree being violated is unjust, immoral, or unconstitutional. Interestingly, Martin also includes the aspect that a decree can be violated on the grounds of being contrary to good public policy. From these two definitions, I will adopt that civil disobedience is a deliberate, nonviolent act directly resisting or violating a legally sanctioned or enforced injustice.

Aquinas' Theory of Law

Aquinas' potential justification of civil disobedience is rooted in his theory of law. He maintains that there are four types of law: eternal, divine, natural, and human. The distinction between natural law and human law is where conflict arises and civil disobedience becomes

relevant. Eternal law is the unchanging moral law that Aquinas also holds is the law of God. Aquinas believes that "the received is in the receiver according to the mode of the receiver" (*On Human Nature* 136). That is, a being can only receive knowledge in a way and form that is suited to their own form of being. Therefore, humans cannot know God's law as God does, given that humans and God are fundamentally different types of beings. Aquinas posits, "There are two ways in which a thing can be known," either "in itself" or "in its effect" (*Summa Theologiae I-II* Q. 93 A. 2*)*. Humans know eternal law in this second way. He states, "No one except the blessed in heaven . . . can know the eternal law as it is in itself. However, every rational creature knows the eternal law with respect to more or less what radiates from it" (*ST I-II* Q. 93 A. 2). By this, Aquinas means that humans cannot know eternal law in its essential form, but only through its derivatives and effects. This phenomenon is what gives rise to natural law, which is the rational human participation in eternal law; it is the law we arrive at via reason and adhere to on moral grounds. Yet neither of these laws are as readily apparent as human law created by the legislature, or divine law commanded by scripture or holy texts; they are not universal as eternal or natural law are. Indeed, it is obvious that there are different human laws and divine laws practiced and enforced around the world, as countries maintain their own governments and legal systems and religions feature differing holy texts. Human and divine laws are more accessible than eternal and natural law, as they are in all likelihood codified and therefore widely acknowledged.

While humans cannot know eternal law, natural law is supposedly our rational participation in eternal law. How are we to know natural law? Aquinas asserts, "The first precept of law is that good ought to be done and pursued and that evil ought to be avoided" (*ST I-II* Q. 94 A. 2). This provides the foundation for all other precepts, which are the "practical precepts" or the general rules by which we might govern our practical actions. Aquinas describes humans as rational living substances who have multiple inclinations, or tendencies to an end, that are logically incorporated into natural law. As beings, humans have an obligation to preserve that state of being, meaning there is an obligation to self-preservation. Humans also have animal inclinations, namely to reproduce, protect, and teach our offspring. As rational beings, humans have an "inclination toward knowing the truth about God and toward living in society" (*ST I-II* Q. 94 A. 2). Though numerous precepts seem unwieldy, Aquinas maintains that each of these inclinations are regulated by reason and therefore fall under the single precept of reason. Aquinas believes that the will is necessitated toward a single natural end: happiness. Unlike more modern ideologies, Aquinas does not believe that the happiness of the individual is competing with the happiness of the community (*ST II-II* Q. 58 A. 5). They should, in theory, be in harmony, because "while a part, as such, belongs to a whole, so that whatever is the good of a part can be directed to the good of the whole" (*ST II-II* Q. 58 A. 5). The common good should be good for the individual and vice versa. Natural law

can then be thought of in terms of the individual or the community.

Conflict appears when natural law and human law overlap, as they will interact in one of two ways. In an ideal scenario the two will comply: the human law will affirm what is morally just and expressed in the natural law. Otherwise, the two can fail to comply. Aquinas maintains that natural law is superior to human law as it is humankind's rational participation in God's law, which is the highest and most absolute authority—it is difficult to imagine the rationale explaining how the arbitrary rule of humans could surpass the moral obligations we have derived from God's law. Given this context, we can understand Aquinas' statement: "If in any point [human law] deflects from the law of nature, it is no longer a law but a perversion of law" (*ST I-II* Q. 95 A. 2). Aquinas does not intend to say that an unjust human law ceases to exist. Rather, he believes its authority is nullified. He writes, "Laws can be unjust . . . by being contrary to the *divine* good, as are tyrannical laws that induce men to idolatry or to do anything else that is contrary to divine law. It is not permissible to obey such laws in any way at all" (*ST I-II* Q. 96 A. 4). Natural law, as the human expression of eternal law, carries an analogous level of authority. One can logically infer that an unjust human law—one that violates natural law—is not only a law that it is morally permissible to ignore, but is a law that one is morally obligated to disobey.

Aquinas in the Twenty-First Century

Let us return briefly to our established definition of modern civil disobedience, which states that civil disobedience is deliberate, nonviolent, and resistant toward a legally sanctioned injustice. This definition immediately resonates with conclusions drawn from Aquinas' theory of law, as the proponents of both modern civil disobedience and Aquinas insist that an unjust law must not be obeyed. The arbitrary law of humans enforces this injustice, for both modes of thought, because choosing to disobey an unjust law necessarily puts the actor in direct conflict with the unjust law. Unfortunately, this does not clarify the situations in which civil disobedience should be applied or what the eventual goal of the action may be.

Aquinas states that an unjust law is not a binding law (*ST I-II* Q. 96 A. 4). The straightforward path, then, is to ignore or actively disobey unjust laws. What is unjust? Aquinas again clarifies that an unjust law is one that violates natural law. But natural law, unlike human law, is not written or so easily accessible. To what extent should humans trust their own rational powers? A modern disobedient should be able to articulate why a law is unjust before they act in a contrary manner, if for no other purpose than for their own defense in social and legal spheres. To justify this imperative, Aquinas would likely turn to his notions of "synderesis" and conscience. Aquinas believes that "There must be some permanent principle which has unwavering integrity, in reference to which all human

works are examined, so that that permanent principle will resist all evil and assent to all good" (*Questiones Disputatae de Veritate* Q. 16 A. 2). This is the role filled by Aquinas' notion of synderesis: it is the principle within us that is unfailingly inclined toward the good. The conscience, then, "is nothing but the application of knowledge [synderesis] to some special act" (*QVD* Q. 17 A. 2). Conscience can err in its application of synderesis, but synderesis itself does not err.

Though conscience is sometimes faulty, Aquinas maintains that conscience is "certainly binding" and necessitates one toward the good in concrete instances; however, synderesis directs one toward the good in a more abstract, universal way (*QVD* Q. 17 A. 3). This binding conscience only extends so far as knowledge informs it. Aquinas makes a point of saying that conscience cannot bind someone to precepts of which they are ignorant (*QVD* Q. 17 A. 3). The best method seems to be to return to Aquinas' inclinations; if a law violates any of these inclinations, it would appear that such a law contradicts natural law. Yet mistakes are not beyond us. This is another reason that civil disobedience should be public—if the disobedient is in fact violating a just law, the legal ramifications still apply.

A recent example of civil disobedience is the occupation of land by those protesting the Dakota Access Pipeline. The Standing Rock Sioux tribe—supported by other tribes, independent groups, and protestors—illegally occupied private land to halt the construction of a pipeline they claimed endangered environmental safety and violated their legal rights. The threat that a potential oil spill poses to the water supply in the area also threatens the health of individuals and the community. Many elements of modern civil disobedience and Aquinas as I have presented them are relevant here. The requirements for modern civil disobedience assumed in this essay seem entirely met: the protest was deliberate and nonviolent. Though the act of occupying land was not a strict contradiction to the injustice—for instance, if the unjust law was a permit allowing construction and the protestors had worked to deconstruct the pipeline during and after its construction—the occupation resisted the pursuit of the ends offered by the unjust law. The unjust legal allowance at Standing Rock does not mandate any kind of human action, but merely permits it. The protest does not seem to work counter the law itself, but rather against those who might take advantage of their new legal freedom to act unjustly. By Aquinas' account, is it permissible not only to engage in civil disobedience, but also to interfere with injustices committed by others? I think that our practical precepts to preserve ourselves and live in a community would require us to resist unjust actions by others if they harm our individual persons or the good of the community. The violation of the Sioux people's legal rights are undeniably important, but I think Aquinas would, based on natural law, support the civil disobedience for the sake of environmental rights. To compromise the water supply is to violate the precepts of law and reason. Physically endangering a community demands some form of resistance to the law that makes such a scenario possible, and it could

plausibly be argued that Aquinas would not condone a method as indirect as in the case at Standing Rock.

Another issue lies in an ideological conflict. Though Aquinas understood laws as benefiting both the community and the individual, our Western concept of liberalism may not always align the two. What if a law appears unjust to the individual but plausibly benefits the community? I imagine that Aquinas would have evaluated these on a case-by-case basis. Take for example a military draft. Is it moral to send individuals into a scenario where they may die if their country is benefiting from their potential sacrifice? Aquinas outlines three requirements for a "just" war. First, he requires that a sovereign gives authority to wage war. Second, those being attacked must be at fault in some way. Lastly, the war must be waged with pure aims, such as restoring peace or otherwise pursuing the good (*ST II-II* Q. 40 A. 1). If Aquinas' conditions for just war are fulfilled, I imagine that Aquinas would support a draft and therefore would not consider the situation unjust or demanding of civil disobedience. This would align with his position maintaining that the individual acts as a part of the whole. Unfortunately, it is difficult to find scenarios that are so clear-cut in history. The United States utilized the draft during the Vietnam War, but it is doubtful that Aquinas would have found the conflict as a whole to fulfill his conditions for just war. In this instance, I imagine that Aquinas would have condoned civil disobedience.

The Consequences of Action and Inaction

The remaining question seems to be, to what end? What is the aim of civil disobedience, and what aim would Aquinas accept? Rawls includes in his definition that civil disobedience is "usually done with the aim of bringing about a change in the law or policies of the government" (320). With our modern perspective of civil disobedience, this does seem right. But is a change in policy resulting from civil disobedience a mandatory end that one must seek? Aquinas would not require this outcome, but he does require that change is a likely consequence of the action. He explains that human law can change for two reasons: by reason or by humans. With reason, the law will "gradually move from what is imperfect toward what is perfect," and humans are justified in changing the law as their social and cultural situations shift (*ST I-II* Q. 97 A. 1). However, Aquinas also posits that the common welfare is damaged by the changing of human laws, so "human law should never be changed unless the damage done to the common welfare by the change is wholly compensated for in some way" (*ST I-II* Q. 97 A. 2).

Still, many accept the aim to make legal change as a part of the definition of civil disobedience. It does seem to follow that an unjust law should be changed so it can comply with natural law. However, if this end is accepted as a necessary condition, several additional points and questions must be considered. If legal change is the aim, it seems plausible that one

is morally obligated to go through every legal channel to change laws or policies. Would one be required to engage in civil disobedience while pursuing legal action? There is something odd about simultaneously adhering to the tedious legal system to change a law while disobeying another law enforced by the same system. If civil disobedience is done for the sake of adherence to natural law alone, the mere deliberate act of resistance would be enough. But if the aim is to change policy, more elements are required for success. Likely one would need many participants, high visibility, and support from figures with power. And if many aspects seem to fall short and the chance of successful policy change is slim, should the effort be abandoned? Presumably there is no scenario where one must either pursue both acts of resistance and policy change or neither. For this reason, I would argue that Aquinas would say no, the effort should not be abandoned. One must never comply with an unjust law, according to Aquinas (*ST I-II* Q. 96 A. 4). However, I believe Aquinas would urge that the disobedient abandon their attempt at policy change.

Of course, no discussion of civil disobedience would be complete without considering the consequences. Plainly stated, civil disobedience is breaking the law. Though the term is frequently used to include protests and dissent, both actions are legal and therefore not encompassed by civil disobedience as defined above. People who do feel morally compelled to commit civil disobedience must also be willing to bear the consequences. Perhaps the most immediate concern is that a peaceful act of civil disobedience will be met with violence from authorities; this has been the case in several instances throughout history, including during the Children's Crusade in Alabama in 1963 and at Standing Rock in North Dakota in 2016. There are also, of course, legal consequences. As Harold Pollack writes, "This [civil disobedience] isn't something to be done lightly . . . What are the possible consequences of having a criminal record?" ("Thinking About Committing Civil Disobedience"). This consideration surely must have crossed Aquinas' mind: individuals may have to sacrifice much in the name of civil disobedience. And beyond the individual the community must be considered, too. If a community is fragile and engages in civil disobedience to stand for rights they have been denied, what happens if most of the community is imprisoned? Here it almost seems that natural inclination for self-preservation would discourage community members from civil disobedience. To deliberately act in a way that endangers the community seems to contradict pursuit of the common good (*ST I-II* Q. 94 A. 2). But this would likely be an exceptional case, if it exists at all. Though there are many serious consequences of civil disobedience that every person must consider for themselves, generally speaking I believe Aquinas would have thought that the moral obligation outweighs the consequences, and that the act should be taken and the consequences accepted. Adherence to natural law is paramount (*ST I-II* Q. 94 A. 2). Even if the consequences are not accepted, the disobedient act should be performed. The words of Martin Luther King Jr. offer what I imagine is a sentiment like one that might have

been expressed by Aquinas: "I submit that an individual who breaks a law that conscience tells him is unjust, and who willingly accepts the penalty of imprisonment in order to arouse the conscience of the community over its injustice, is in reality expressing the highest respect for law" (72).

A Historical Dilemma

Civil disobedience clearly has many facets, and it seems that in actual situations these elements can conflict. The International Military Tribunal, held from 1945 to 1949 in Nuremberg, Germany, tried individuals accused of war crimes during World War II. Interestingly, the more extreme formulation of Aquinas' justification of civil disobedience was used by the prosecution: the accused may have been following orders, but *they had a moral obligation to disobey unjust commands*—that is, to engage in civil disobedience. The prosecution, problematically, asserted that these orders conflicted with international law; as Carl Cohen explains, "Many of the laws these persons were convicted of knowingly violating were not codified at the time the acts were perpetrated. In that sense the laws were *ex post facto* and unjustly applied" (199). This is an obvious legal problem, and for many it undermines the supposed justice served by the Tribunal. But would it be a problem for Aquinas? The argument of the prosecution would have likely suited Aquinas; Cohen summarizes it by saying, "Some things a man must not do, no matter who orders him to, or with what authority. And if he does do them he will be answerable, on this principle, not only to God or conscience but to courts of international law as well" (199). However, this fails to account for the consequences if one does not obey the corrupt order. Cohen himself responds to this, saying, "Taken as a moral justification only, the Nuremberg argument may ultimately prove his disobedience right—but it cannot protect him against the legal punishments his government or military superiors are likely to inflict upon him" (201).

Would Aquinas care about this coercive element of the heinous acts committed under the order of superior authority? It is plausible that Aquinas would have felt a certain measure of sympathy for those who were purely coerced, but the elicited act of the will was still one of resistance. Yet I believe Aquinas would have agreed with the prosecution, even without the presence of international laws, that those who simply "followed orders" had a moral obligation to defy their orders. Aquinas maintains that obeying natural law is essential (*ST I-II* Q. 94 A. 2). He does not indicate any exceptions. In such a devastating event, it is perhaps more clear than any other time that natural law must be heeded regardless of the cost.

Like many great philosophers, the thoughts of Aquinas are engaging; when invoked by a wordsmith such as Martin Luther King Jr., they are moving and inspiring. Civil disobedience and its call to obey a higher moral law have been the weapon of the people for centuries; yet civil disobedience hardly ever appears without creating philosophical or legal controversy.

In many instances, it is questionable whether Aquinas would support the action at all. The justification of civil disobedience requires a return to the foundation that Aquinas carefully laid to remind us of the assertions that lead us to the conditions of civil disobedience: that one disobeys an unjust law with intent, and does so peacefully and directly. Aquinas builds a theory of law deeply tied to moral reasoning; by trusting in the rational perception of eternal law, his theory asserts that it is morally required to disobey unjust human law.

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Contributor Biographies

Chief Faculty Editor

Molly Clark Hillard, PhD, is an associate professor of English, and chief faculty editor for *SUURJ*. She is thrilled to be part of this project, and is grateful for and proud of her collaborators. She is also the coordinator for research at Seattle University, for which she hosts the student conference SUURA, and awards research grants. When she is not busy supporting student research initiatives, Dr. Hillard can be found teaching and writing on Victorian literature and culture for the English Department, University Honors, the University Core, and Women and Gender Studies. She is the author of *Spellbound: the Fairy Tale and the Victorians* (Ohio State University Press, 2014), has published widely in peer-reviewed journals and books in her field. Dr. Hillard regularly moonlights as a technical writer and copyeditor for various non-profit and for-profit organizations, where her subjects are as various as snow leopards, ultrasound technology, and black holes. In her other waking hours, Dr. Hillard is an avid runner, and parent to two small kids and two large cats.

Journal Design

Caleb Hou graduated from Seattle University's Digital Design program in 2014. He designed the logo, brand, and visual aesthetics of *SUURJ* after joining the team in Fall Quarter of 2017. He currently works as a User Experience Designer at Best Buy's Mobile Apps team and enjoys socializing and bringing his dog, Audrey, to the park in his free time. He is passionate about design and hopes to continue to find more opportunities to exercise his visual and creative skills in projects such as *SUURJ* in the future.

Student Editors

Avalon Ashley is a senior at Seattle University graduating with a Bachelor's Degree in English for Creative Writing with Departmental Honors. She worked on *SUURJ* as a first-stage editor. After graduating from Seattle University, she plans to travel and continue freelance writing, copyediting, and fact-checking. Her work has been featured in Alaska Airlines Magazine.

Jordan Ayers is a third year English major and Writing Studies minor. She coedited "Trends of Migration and Their Effects on Youth in Nicaragua" as a student copyeditor alongside Andrea Fox. Outside of SUURJ, she works as a writing consultant at the Seattle University Writing Center and has close ties with the Center for Community Engagement's tutoring programs at Bailey Gatzert Elementary. After graduating from Seattle U in 2019, she hopes to use her knowledge of copyediting, rhetorical composition, and story writing to study post-colonial Haitian fairytales and Special Education policy reform.

Callie Craighead is a third year English major who studied in the University Honors program. She served as the student editor for Rachael Yonek's essay, "Civil Disobedience: What Would

Thomas Aquinas Do?" and worked on the design team during the publication stage of *SUURJ*. She has worked as an editorial assistant at *Seattle* magazine and as a publishing intern at Seattle Arts and Lectures. Callie will be graduating in December 2018 and hopes to apply the copyediting skills she learned as a student editor by pursuing a career in editing or publishing.

Sena Crow is a third year English major with a Women and Gender Studies minor and anticipates to graduate in March 2019. During winter quarter of 2018, she copyedited "Exploring the Therapeutic Potential of Psychedelics." Working alongside students and peers during the editing and publishing process of *SUURJ*, she has built new connections within the university and her own professional development. Hoping to become a scholar herself, she is passionate about giving undergraduate students access to the opportunities of the academic world and celebrating interdisciplinary work.

Jessica DeWitt is a third year Creative Writing major with a minor in Business Administration. She works as an Outdoor Program Coordinator, a Writing Center Consultant, and a Media Production Assistant. She served on *SUURJ* during the Fall of 2017 and as a copyeditor of "The Sovereign Nation of Hawai'i: Resistance in the Legacy of Aloha 'Oe" during the Winter of 2018. After graduation, Jessica hopes to work in the fields of publishing, marketing, or some other creative and critical job.

Alicia Ezekiel-Pipkin is graduating June of 2018 with a major in Creative Writing. *SUURJ* provided her with editorial skills that she hopes to further apply in graduate school. After commencement, Alicia will attend University of Central Florida as a nonfiction writer in the Masters of Fine Arts program. She hopes to assist in editing the university's journal, *The Florida Review.* After receiving her MFA, Alicia plans on teaching secondary education.

Andrea Fox is a second year Creative Writing major who intends to pursue a Writing Studies minor before her 2020 graduation. She coedited "Trends of Migration and Their Effects on Youth in Nicaragua" and served as a member of the *SUURJ* recruitment team. Along with gaining the practical skills of launching a journal, she is grateful for being able to engage with Seattle University's academic research community through her *SUURJ* experience. In the future, Andrea plans to pursue a career as a writer and editor at a publishing agency with the hopes of publishing her own novel.

Danae Golding is a senior at Seattle University majoring in English Literature. She will be graduating in June of 2018 with Departmental Honors. Danae edited the interdisciplinary short

communications piece titled, "Revolutionary Education Engaging Students and Communities with Middle School Service Learning." *SUURJ* helped her gain copyediting experience and professional development through coursework associated with the journal. As an aspiring editor, Danae finds that working as a student editor on *SUURJ* gave her the most applicable, hands-on coursework for her future career.

Jesse Goncalves is a third-year Applied Mathematics major with minors in Physics and Writing Studies. He is proud to have been a part of the *SUURJ* community for the past two years, first as an author and now as a copyeditor. This year, he edited "Framing Protesters: Description Bias in the Coverage of the Malheur National Wildlife Refuge and Charlotte Protests." Inspired by his experience with *SUURJ*, Jesse plans to pursue a career in STEM communication, perhaps working at the intersection of education and policy.

Katie Miller is a third year Sport and Exercise Student with minors in Psychology and Biology, expected to graduate in the Spring of 2019. She worked alongside Jesse Goncalves on the piece titled "Design and Fabrication of a Prototype Coupler Component to Facilitate the Concurrent Collection of Mixing Chamber and Breath-By-Breath Metabolic Measurements." Participating in the production of *SUURJ* has been a rewarding experience, and she has especially enjoyed combining her love for writing with research. In the future, she plans on applying to graduate school for Occupational Therapy.

Michelle Newblom is a sophomore creative writing major. She plans to graduate in 2020 and to pursue a career in writing or editing. Michelle edited "Social Support as a Moderator for Stereotype Threat's Effects on Working Memory" during winter quarter and was a part of the marketing team in spring quarter. *SUURJ* has not only improved her editing skills, but it has also heightened her ability to market a journal and further her passion for writing. Michelle entered fall quarter with hopes of being a writer of some sort and *SUURJ* has opened up new possibilities for her in the fields of editing and publishing.

Jenna Ramsey is a senior at Seattle University from Austin, Texas. She will graduate in June with a B.A. in English Literature. During her time at Seattle U, she worked for three years at the university newspaper, *The Spectator*, and served as its editor in chief during the 2016-2017 academic year. After graduating, she hopes to find a position in writing, editing, or publishing.

Mackenzie Reed is a senior Creative Writing major with a Writing Studies minor. She worked with Lucas Bartholomew-Good and Megan Rodden on the scientific paper, "Sub-Lethal

Effects of Heavy Metal Pollution on Intertidal Crustaceans in the Duwamish Waterway." After graduating this spring, she isn't entirely sure what she wants to do with her degree, but is considering pursuing a Master's degree in Writing at Portland State University.

Megan Royce is a sophomore at Seattle University, intending to graduate in 2020 as a Digital Design and English double major. She edited the essay entitled "Dream Recall, Sleep Quality, and Short-Term Memory." Watching the second volume of *SUURJ* come to life has been an incredibly rewarding and enlightening experience for her. In the future, she would like to combine her education in graphic design with her experience in English to help bring into the world more projects like these.

Student Authors

Sufia Ahmad is a senior Psychology major. Her research was conducted in the Statistic and Research Methods course at Seattle University, seeking to understand social supports moderating effects on working memory. The project investigated if social support can moderate stereotype threats and negative effects on cognition. Sufia is graduating in June with a Bachelor of Science and works as a Research Scientist in Dr. Elizabeth Buffalo's Learning and Memory Lab in the Biophysics and Physiology Department at UW. She plans to apply to a doctorate program in behavioral neuroscience upon completion of her research at the lab.

Lucas Bartholomew-Good is a recent graduate of Seattle University with a major in Biology and a minor in Italian language. His undergraduate research was conducted with the support of Dr. Kristin Hultgren. His paper investigated the effects of industrially polluted marine ecosystems around the Seattle area. The project combined work from a few researchers to create a broad investigation into how to measure such long-term devastation. Currently positioned at an agricultural internship in Washington State, Lucas hopes to combine his love of agriculture and food systems with biology to look to agricultural based solutions to climate change and social change.

Laura Meaghan Bogart graduated from Seattle University in 2017 with a double major in International Studies and Spanish and a minor in Latin American Studies, graduating with honors from the Department of International Studies. The fieldwork that led to her senior thesis was in partnership with the Universidad Centroamericana (UCA) and was conducted in Chinandega, Nicaragua from 2015 to 2016. In 2017, she returned to Nicaragua to present her findings alongside her Nicaraguan colleagues at a conference for young researchers. Time spent in Nicaragua has not only provided data for her research, but also allowed her to form close friendships with students and professors from the UCA. After graduating, Meaghan

lived in Peru for six months and worked with StoveTeam International, an NGO that supports entrepreneurs in Central America who produce safe and fuel-efficient cookstoves for their communities. She hopes to return to Nicaragua soon.

Evelyn Chow was born and raised in Honolulu, HI as a first-generation American. They are a third-year student majoring in Sociology and Philosophy and minoring in Global African and Asian Studies at Seattle University. They are interested in the dynamics of power and resistance, specifically resistance as a form of power. This research project attempts to unravel the effects of cultural degradation as part of our American colonial legacy. Evelyn is interested in dismantling fictions of American exceptionalism, and this work is important to them not only because of their personal stake but also because of the political, historical, and educational ramifications of U.S. imperialism in their hometown.

John Reinke is a junior studying Mechanical Engineering. During the end of his sophomore year, John worked on a project for Dr. Hamel and Dr. Machak which coupled mechanical design to a real design problem faced by the Kinesiology Department. After working on this project, John plans on using his experiences to further develop his versatile skill set as an engineer. Currently interested in engineering product design, he plans on broadening his scope of work to bring engineering intuition into practical design and innovation for the future.

Megan Rodden graduated from SU in the spring of 2017 with a BS in Marine and Conservation Biology and a minor in Chemistry. During her time as an undergraduate she investigated the effects of lead sediment contamination on benthic osmoregulation and reproduction with Dr. Kristin Hultgren. The study provided preliminary data for further investigation into the relationship between benthic crustaceans and sediment contamination to produce this paper. After graduation Megan worked as a water quality researcher at King County, and currently works as a laboratory assistant at Benaroya Research Institute studying autoimmune diseases. In the future she hopes to work in environmental law, bridging the gap between science and policy to help protect ecosystems from pollution and urbanization.

Mary A. Schiele is a second-year Criminal Justice and Political Science double-major from Portland, Oregon. Her paper investigates the differences in the national media coverage of the Malheur antigovernment and Charlotte Black Lives Matter protests. Her project was inspired by her observations of the local media coverage of the Malheur protests in Oregon, especially in comparison to other protests across the nation. Through her research she discovered some discrepancies in how the protests were covered, which could occur in other news events across the United States. Allie hopes to continue exploring her fascination with politics after graduating from Seattle University, in either law or graduate school.

Claire Star will graduate in June 2018 with a BA in Interdisciplinary Liberal Studies and a minor in Psychology. Since 2015, Claire has worked at Washington Middle School as an academic mentor. Her experience within the Seattle Public Schools informed her piece which responds to student appeals for engaging, student-driven learning opportunities. Claire's research interests include nontraditional and project-based learning, culturally responsive teaching, literacy, and teacher training. She intends to pursue a career in secondary education.

Ali Williams is a soon to be graduate of a Bachelor of Science in Psychology from Seattle University. Born in Portland, Oregon Ali was drawn to Seattle by her research interests. While her current project focuses on sleep and memory, Ali's other research interests include examining the biopsychosocial impacts of trauma and support for evidence-based practices in public health. Ali plans to continue in research and apply this information to clinical practice in the future.

Rachael Yonek is a fourth-year Philosophy major with an interest in global challenges. Her enthusiasm for political philosophy and current topics spurred her work on civil disobedience and Thomas Aquinas. After the election of Donald Trump and the subsequent rise in acts of civil disobedience, she took great interest in the commentary on such an act that had roots as far back as the medieval period. The potential for civil disobedience embedded in Aquinas's theory of law connected strongly to Rachael's questions surrounding conflict, ethics, and American political culture. Rachael plans to continue to pursue philosophy after graduating in June of 2018, and will start the PhD program in Philosophy at Vanderbilt University in the fall.

Faculty Contributors

Josh Hamel, PhD, PE is an assistant professor of Mechanical Engineering and a researcher with a background in multiple engineering disciplines. He contributed to "Design And Fabrication of a Prototype Coupler Component to Facilitate the Concurrent Collection of Mixing Chamber and Breath-By-Breath Metabolic Measurements." His current research focuses on multidisciplinary design optimization and the integration of design optimization and manufacturing. Dr. Hamel is a licensed professional engineer and is also a veteran of the U.S. Navy.

Sean Machak, MA is the Laboratory Supervisor for the Sport and Exercise Science undergraduate program and is an adjunct faculty member in the Kinesiology Department. His research interests focus on exercise physiology. Working with Dr. Hamel and John Reinke, he contributed to the essay titled "Design And Fabrication of a Prototype Coupler Component to Facilitate the Concurrent Collection of Mixing Chamber and Breath-By-Breath Metabolic Measurements."

Faculty Content Editors

Kathryn Bollich, PhD, teaches undergraduate courses in Personality Psych, Statistics and Research Methods, Advanced Statistics, Positive Psych, and Intro Psych. Her research examines how people make sense of themselves and each other, including questions about self- and other-knowledge of personality and moral character, how we change over time, and the exchange of interpersonal feedback. She served as the faculty content editor for Ali Williams and Camille Tabari's essay.

Serena Cosgrove, PhD, is an assistant professor of International Studies and teaches in the Matteo Ricci College. She is an anthropologist and sociologist. Her current research interests focus on women's leadership in post-conflict settings in Central America and the Democratic Republic of Congo as well as indigenous rights and constructions of indigeneity in Nicaragua. Dr. Cosgrove is the author of *Leadership from the Margins: Women and Civil Society Organizations in Argentina, Chile, and El Salvador* (Rutgers 2010) and co-author of the book, *Understanding Global Poverty: Causes, Capabilities, and Human Development* (Routledge 2017). Dr. Cosgrove served on the faculty advisor board and was also the content editor for Laura Bogart's essay.

Kendall Fisher, PhD, is an assistant professor of Philosophy. Her expertise is in Medieval philosophy and her research focuses on the metaphysics of Thomas Aquinas and his philosophy of the human person. Her work has been published in the *British Journal for the History of Philosophy*. She served as the faculty content editor for Rachael Yonek's essay that analyzed Aquinas' theory of law and his justification for civil disobedience.

June Johnson Bube, PhD, is an associate professor in the English Department, Director of Writing Studies, and Writing Consultant to the University Core. As a nineteenth-century Americanist, she has published articles on women's writing about the American West. As a rhetoric and composition teacher-scholar, she has authored Global issues, Local Arguments (3rd edition), an argument reader and rhetoric focused on civic literacy and a cross-curricular introduction to global problems. She is also co-author of two nationally-used writing textbooks: *The Allyn and Bacon Guide to Writing* (8th edition), a writing-across-the-curriculum rhetoric, and *Writing Arguments* (10th edition), a leading argument text. Her current teaching and research areas include global studies, argumentation, Rogerian communication, first-year composition, writing transfer, reflective writing, and writing for civic engagement. She serves on the *SUURJ* Faculty Advisory Board and was the faculty content editor for Claire Star's essay on middle school service learning.

Mark Jordan, PhD, is an assistant professor of Biology and teaches courses on ecology and conservation biology. He served as the faculty content editor for Lucas Bartholomew-Good and Megan Rodden's essay on the effects of heavy metal pollution on crustaceans. His research and teaching are motivated by a desire to use the tools of wildlife biology and conservation genetics to restore degraded landscapes. His work has been published in *Northwestern Naturalist* and *Northwest Science.*

Kate Koppelman, PhD, is an associate professor in the English Department who also teaches in Medieval Studies, Film Studies, and Women and Gender Studies. Her teaching and research interests focus on Medieval literature and culture and psychoanalytic theory. She served as faculty content editor for Evelyn Chow's paper.

Elise Murowchick, PhD, is a lecturer in the Department of Psychology where she pursues research that includes child and adolescent health, risk behaviors, and well-being. She is trained in Human Development and Family Studies, and Biopsychology, Health Psychology and her work has been published in the *American Journal of Public Health*. Dr. Murowchick served as a faculty content editor for Sufia Ahmad and Erica Wells' paper that examined the role of social support in working memory.

Frank Shih, PhD, is an associate professor of Mechanical Engineering and teaches courses in materials science, structural mechanics, and mechanical design. His research focuses on applied mechanics and failure issues in composite and other advanced materials used in aerospace and biomedical applications. His work has been published in the *Journal of Advanced Materials.* He served as the faculty content editor for John Reinke, Josh Hamel, and Sean Machak's paper.

Michael Spinetta, PhD, is an associate professor of Psychology. He served as the faculty content editor for Xavier Hernandez's essay that examined the therapeutic potential of psychedelics. Dr. Spinetta has a PhD in Behavioral Neuroscience. He is particularly interested in learning and memory and psychopharmacology, with an emphasis on the consolidation and reconsolidation of emotionally salient events and the effects that drugs of abuse and therapeutic drugs have on the learning process, including the formation, storage and retrieval of memories.

Hannah Tracy, PhD, is a senior instructor in the English department who teaches literature and composition courses. Her teaching and research interests include the intersections of

literature and science, political rhetoric, and media analysis. She served as the faculty content editor for Mary Schiele's essay which examined bias in media coverage of protests.

Faculty Advisory Board

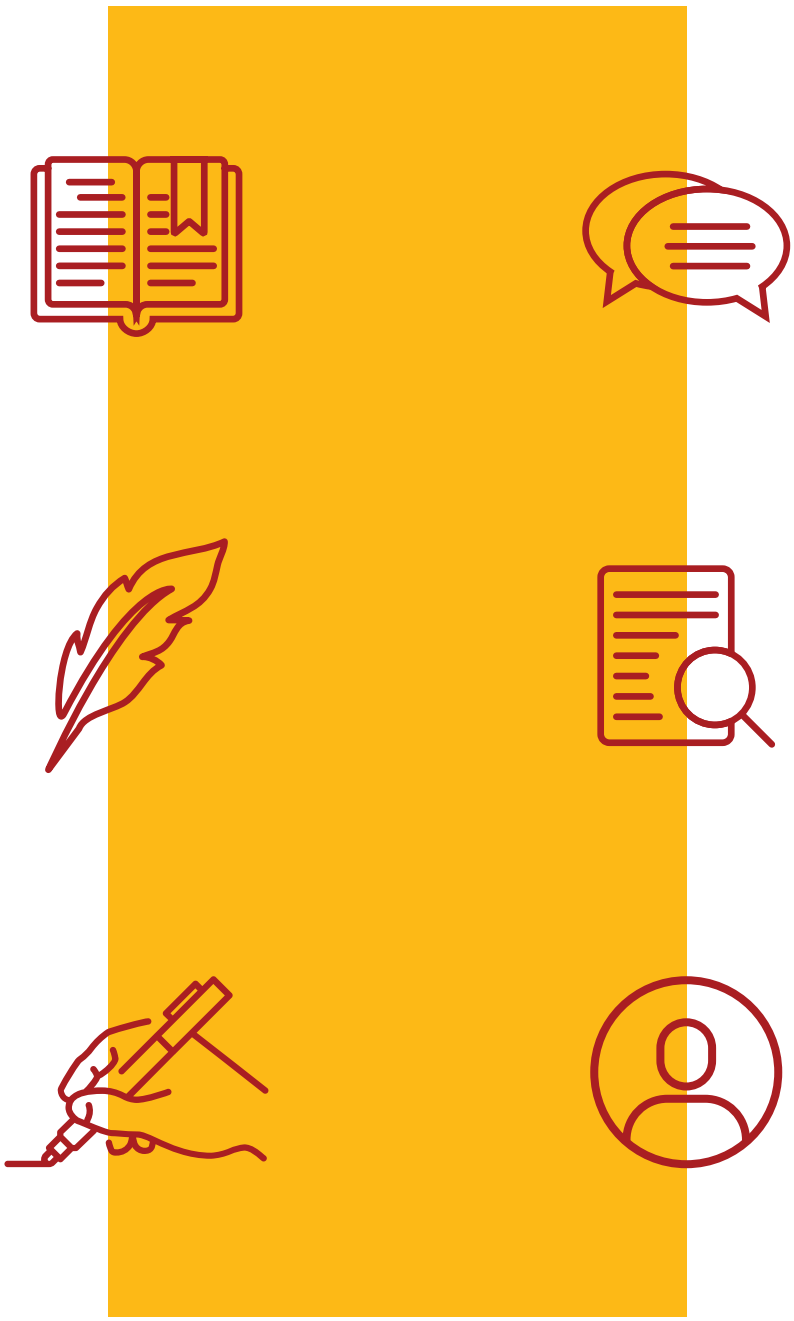
Marc A. Cohen, PhD, is an Associate Professor with a shared appointment in the Department of Management and the Department of Philosophy. He earned a doctorate in philosophy from the University of Pennsylvania and, prior to joining Seattle University, worked in the banking and management consulting industries. His research concerns trust, moral psychology, management theory, and questions in social/political philosophy about what makes society more than an accidental crowd.

Serena Cosgrove: Bio included above

Lynn Deeken, MLIS, is the Director of Public Services and Coordinator of the Learning Commons Partnership at the Lemieux Library and McGoldrick Learning Commons. As a member of the library faculty, her areas of responsibility include Circulation, Research & Information Services, Instruction and collaborating with the Learning Commons Partners. She is the liaison to the English Department (Literature, Creative Writing, Film Studies) and the Cul 164 ture and Language Bridge Program. Her teaching focuses on the development of both interdisciplinary and discipline-focused information literacy. Research interests include assessing the Library and Learning Common's impact on student learning, success, and persistence. Lynn served on *SUURJ*'s Faculty Advisory Board to help read, review, discuss, and vote on paper submissions.

Kristin Hultgren, PhD, is assistant professor of biology. She graduated with a B.A. in biology from Brown University, and received her PhD from University of California-Davis, where she studied phylogenetics and behavior of crabs in Japan, California, and Oregon. She then went on to a postdoctoral fellowship with the Smithsonian Institution in Panama and Washington, D.C., studying evolution and behavior of eusocial sponge-dwelling snapping shrimp across the Caribbean. She taught at Vassar College and Bard College in New York, before starting at Seattle University in 2012. She has published over 25 peer-reviewed journal articles and book chapters, and her interests include evolutionary biology of crustaceans, specifically the evolution of camouflage behavior in crabs and isopods and the evolution of social behavior in snapping shrimp.

June Johnson Bube: Bio included above



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